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BULLETIN

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ESSEX INSTITUTE.

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A CURIOUS AINO TOY.

BY EDWARD S. MORSE.

Takashiro Matsura of Tokio, an antiquarian of some note and author of several works on Yezo, the Ainos and Japanese Antiquities, has a miscellaneous collection of old things, comprising stone objects, old Buddhists' desks and specimens of bows, clubs and other objects from Yezo.

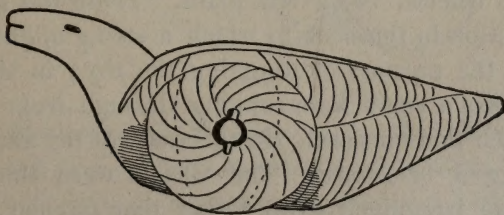


FIG. 1.

In this collection I found a curious wooden toy brought from the Ishikari valley, Yezo, and believed to be an Aino toy. This toy was in the form of a bird on wheels (figs. 1, 2). Such an extraordinary object, as one provided

with wheels, made by savages, led me to make a somewhat careful sketch of it. The object bore the marks of considerable age.

Mr. Matsura believed it to be two hundred years old, upon what grounds I did not clearly learn. The body of the bird had a uniform thickness of 30^m ; apparently as if it had been cut out of a board or plank. The head and neck only were roughly modelled, tapering from the base of the neck which was 18^{mm} in thickness to half that thickness at the end of the bill. The extreme length of the toy was 195^{mm}. The back and sides of the body had a series of curved lines cut upon their surfaces to represent feathers, and

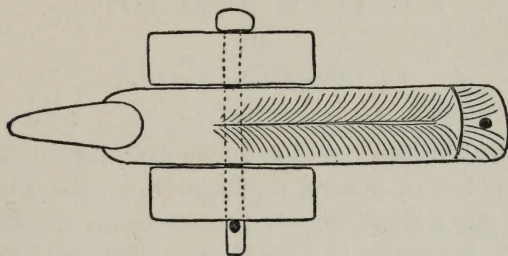


FIG. 2.

an area (indicated by the dotted lines in the figure) hidden by the wheels, being left plain. There was no hole or constriction in the neck to which a string might be attached for the purpose of dragging the toy ; in the tail, however, was a small hole running through from above, evidently for this purpose. In this case the toy must have been dragged backward. The wheels were thick and clumsy, and irregularly ovate rather than circular. This form of the wheel would cause the bird to hop up and down when being dragged. The axle holding the wheels passed through the body near the centre and consisted of a simple wooden pin having a thick head at one end and a perforation at the opposite end into which a small pin could

be inserted. The toy bore all the appearance of having been made by the Ainos. Its rough vigorous make, the manner of cutting the lines for decoration, the clumsy, irregular wheels, all precluded its having been made by the Japanese, though the idea of wheels so foreign to savagery must have been derivative and could have come from the Japanese, but this form of toy I do not remember having seen among the innumerable kinds of toys in Japan.

It was not until several years after that I found another bird toy on wheels. This specimen was in the collections

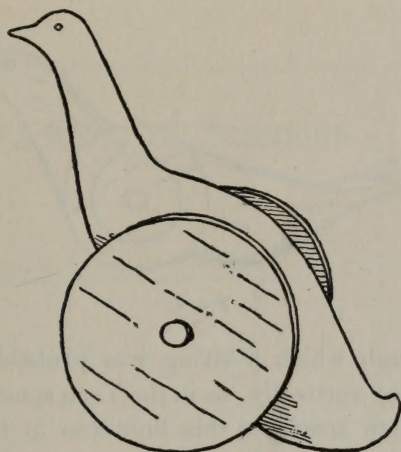


FIG. 3.

of the Ethnological Museum in Berlin. Recalling the Aino toy I made a hasty sketch for comparison. The form of the bird differed somewhat in having a longer neck, a better defined head and the wheels of the toy being circular. This specimen was labelled *Yakuts, Yena, Siberia*. Unfortunately I made no measurements of the specimen though the rough sketch here presented (fig. 3) gives its general appearance in outline. My attention was not again

called to another example of this toy until I found one figured by Mr. W. M. Flinders Petrie, in his interesting work describing his excavations and discoveries in Hawara, Beahmu, and Arsinoe, in Fayum, Egypt (Plate XIII, Fig. 21). In the cemetery of Hawara, dating back not later than the first century of our era, he found a miscellaneous collection consisting of numbers of workmen's tools, bronze knives, wooden lock-bolts, etc. Associated with these various objects he found a wooden toy in the form of a bird on wheels. Its form more nearly approaches that of the Yezo specimen. It is made from a flat piece of wood, and

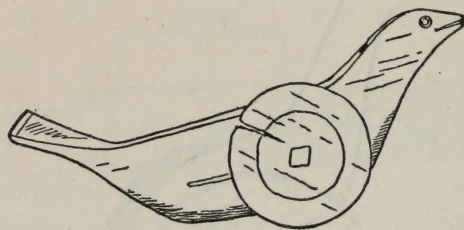


FIG. 4.

a hole, through which a string was probably tied, runs through the toy vertically, as in the Yezo specimen, though in the Egyptian specimen this hole was in the neck and not in the tail. The object is now preserved in the Ashmolean Museum, Oxford.

The three wooden toys above cited, though very simple, are identical in construction. Are they identical also in origin? The ancient specimen exhumed at Hawara by Mr. Petrie is pronounced by him as "very curious."

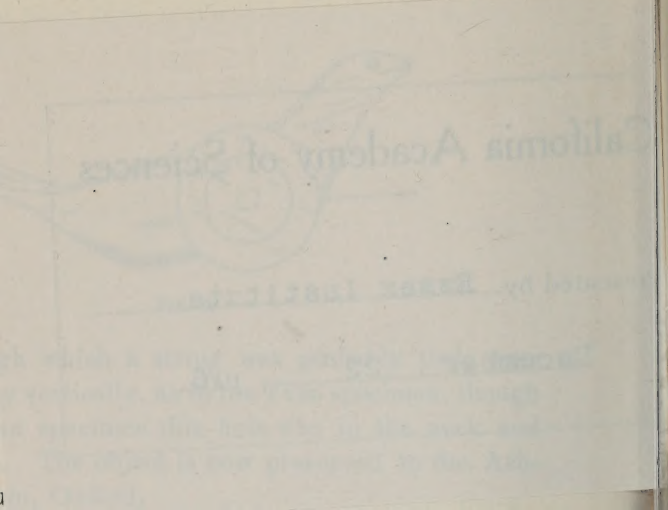
This toy might naturally have originated among a civilized people like the Egyptians, who portray wheeled chariots in their early rock sculpture. The Egyptian chariots are figured with wheels of four and eight spokes. The

California Academy of Sciences

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It is made from a fine piece of wood, and



earliest Egyptian wheel had four or six spokes. Professor Sayce shows that the Hittite chariots had wheels of four spokes. Dr. Schliemann discovered toy wheels at Mycenæ of four spokes, and the Swiss Lake Dwellers had wheel-like ornaments of four spokes. In Asia Minor rough disks of wood (such as these bird toys are provided with) have served as wheels for their vehicles from time immemorial.

With the absence of a wheel in savagery it is impossible to conceive of a low savage race like the Ainos originating a wheeled object of any kind. It is quite easy to understand how the Ainos might have derived the idea of this toy from the Yakuts in Siberia, as Kamschatka and the Kuriles, or Eastern Siberia and the Island of Saghalien formed avenues of communication with Yezo. Did the idea of the toy originate with the Yakuts or were they in turn indebted to their Turkish progenitors in the past for this odd plaything? We are told by philologists that the Yakuts are a distinct Turkish stock preserving many of the Turkish characteristics so strongly that, according to Peschel, it has been said, though with some exaggeration he admits, "that an Osmanli from Constantinople can make himself intelligible to a Yakut on the Yena, but it is certain that the branches of the Turkish language separated by this enormous distance are strangely alike." Is it possible that the remote ancestors of the Yakuts in Turkey derived the idea of this toy from the same people whose ancient villages in Fayum have been brought so clearly to light by Mr. Petrie? Certainly, unless it can be shown that any kind of an object provided with wheels originated among a savage people, it does not seem an absurd conjecture to suggest the common origin of this toy even among peoples so widely removed in space and time as those above mentioned.

An analogous case has lately come to light in a curious wooden object found in a tumulus in Norway. In this case, however, the object is more complex in character. In the *Bergens Museums Aarsberetning* for 1890 is a paper by Gabriel Gustafson, curator of the Antiquarian department in the Bergens Museum, entitled "A Strange Wooden Object found in a Norwegian Tumulus." The tumulus in question contained the skeleton of a man associated with weapons, large pieces of dress, remains of belts, with bronze mountings, brooch-clasps of silver, a gold solidus of Roman origin, etc., objects peculiar to a group of grave-finds which occur in western Norway. The period is supposed to be somewhere between the sixth and eighth centuries. The peculiar point of interest was the finding on the breast of the skeleton a curious wooden object carved out of a single block and made in such a way that it could be opened to form a square, or closed by the various elements shutting up on each other after the manner of interclasping fingers. Whether this object had a mystical meaning or was simply a puzzle, was a matter of conjecture. It was important, however, to seek for some similar object with which to compare. The extraordinary fact is that its counterpart was finally found in the South Kensington Museum labelled as coming from Persia and of modern origin. The Persian specimen differed somewhat in unessential details, but the principle of interlocking, its being wrought from a single block of wood, its closing up in precisely the same way were coincidences of such an extraordinary nature that Mr. Gustafson felt justified in making a somewhat extended discussion of the subject. It seems incredible that two such complex and peculiar objects so closely resembling each other could have originated independently. Mr. Gustafson comes to the conclusion that these objects must have had a common origin.

An observant traveller in Northern Scandinavia will see many things to remind him of Oriental people. If he be fresh from Japan and China he will be impressed with the many features common to both peoples, and realize the survival to-day of many oriental facies. From a zoölogical standpoint one might attribute these similarities to the fact that the east and the west shores of the old world are not separated by an almost impassable barrier; the people are connected by a continuous stretch of continent, and a circumpolar distribution, seen in the case of animals and plants, might also apply with equal force to man and his products. If, however, one considers the ramifications of early Eranians he will see how twigs of this stock penetrated into Scandinavia and thus render explicable the occurrence of this curious puzzle in the far north. Dr. Hans Hildebrand, the Royal Antiquary of Sweden, in his interesting book on *Scandinavian Arts* (South Kensington Handbook) shows that "there once existed during a period of some length a continued intercourse between Mahomedan Asia and Scandinavia." Coins of the Mahomedan States of Asia have been dug up by thousands in Sweden. In an ancient tomb in Gottland was found a bronze fibula, associated with shells from the Indian Ocean, and Dr. Hildebrand says "to a Swede it is quite natural to direct his attention in the first place towards the East." Of greater interest is Dr. Hildebrand's efforts to establish a standard of weight of the ancient ring money, the ornaments of a certain weight and the weights themselves. He says "not to speak of other things, even the weights found in Scandinavia (as well as in Russia) and the manner in which the multiples of the unit are indicated, show the most complete analogy with some oriental weights found in Persia."

GEOLOGICAL AND MINERALOGICAL NOTES: NO. 5.

BY JOHN H. SEARS.

THE following notes on some of the granitic and crystalline rocks of Essex County, Mass., preliminary to a more extended paper, have been prepared in order to record the more important results of my field work during the autumn and winter of 1891-92, which throw much light on the perplexing questions of classification of the endless variety of forms which our volcanic, plutonic and sedimentary rocks assume.

(A) *Augite-Syenite*. (Vom Rath.) Within the city limits of Gloucester, bounded on the north by Warner St., and extending several hundred yards on Prospect St. to the south and southwest, is a large mass of this typical augite-syenite. Occasional outcrops are also seen south of this in East Gloucester, near Bass Rocks, and in the cove in Gloucester harbor west of Ocean pond, which embraces the larger part of Eastern Point and in a westerly direction there are outcrops near Goose cove, Annisquam. One large dome-shaped mass near the corner of Quarry St., Bay View, is of a coarser texture and greener in color, and resembles the augite-syenite of Essex and Manchester. From this last named outcrop to the northeast side of Plum cove, Lanesville, there are numerous outcrops in old

deserted quarries, and one especially good section of this syenite is seen by the roadside opposite Young Avenue, Lanesville. The trend or strike of all of the outcrops is in the usual direction, N.N.E. to S.W.

This entire outcrop is some twelve miles long and from a few rods wide in Hamilton to six miles in Essex and Manchester, the latter width continuing across Gloucester from Lanesville to Eastern Point.

This rock has been recorded as granite by the earlier authors and as granitite by more recent ones. A large part of the granite area mapped by Professor W. O. Crosby in Hamilton, East Wenham, Essex, Manchester and West Gloucester is this typical augite-syenite. Specimens of this rock, which I collected near the terminus of the Essex branch railroad in 1887, were determined by Prof. W. O. Crosby as one of the members of the syenite group, and at that time he advised a careful examination of the rocks of the whole region, which has been done with the above results.

The determinations of the minerals in this rock, studied in thin sections with the polarizing microscope, are as follows:—Orthoclase, brown hornblende, red mica (probably phlogophite), much titanite, numerous fine sections of augite, several small crystals of apatite, a few small zircons, one section of microcline in one of the slides, Baveno twin crystals of orthoclase which show the intergrowth of albite as micropertthite. The augite is often surrounded by magnetite, and dust-like inclusions of magnetite in the orthoclase give this syenite its dark color. In some of the sections from the outcrop at Prospect St., Gloucester, there are some quartz blebs, but the rock as a whole is poor in quartz and resembles the syenites of Charnwood, England, described by Prof. T. G. Bonney and Rev. Edw. Hill (*Quart. Jour. Geol. Soc.* Vol. 34, 1887, p. 215).

(B). *Granophyre* (H. Rosenbusch): *Granulite*. Occupying the region between Freshwater Cove Village and the West Gloucester railroad station, and extending in a

southwesterly direction across Magnolia, Manchester and to the Beverly shore, is an outcrop of granophyre which appears again as a typical granulite in the west cove of Moulton's Misery Island in Salem harbor. To the north this formation cuts the hornblende-granite and augite-syenite from Eastern Point to the shore line at Bass Rocks. From Rocky Neck, East Gloucester, to Bass Rocks, the contact of this granophyre and the hornblende-granite is strongly marked and easily followed. Across Little Good Harbor beach and opposite Salt Island to the inner point of Briar Neck, there are numerous tongues of this rock intruding into the hornblende-granite, while the main mass of the rock is seen on the outer side of Salt Island. It reaches the main land on the shore in the middle of Long beach where it divides, one part following the shore line to Cape Hedge and Emerson's Point, and reaching across to the west side of Loblolly Cove, while the other mass cuts across the granite to Gap Head and Straitsmouth Island, and appears in numerous outcrops from Whale Cove to the town of Rockport. Between Freshwater Cove Village and West Gloucester, this granophyre has the appearance of a massive flow, and it has a similar character where it crosses Eastern Point from Rocky Neck to Bass Rocks. On Emerson's Point and Gap Head, however, it is seen in dome-shaped masses a few feet in diameter, clearly embedded in granite and also varying from this to extensive eruptive forms. It is probable that this entire formation has a massive, intrusive, granitic structure, which has in places widened out into dome shapes, while in others it has become contracted into dike-forms from a few inches to a number of feet in width. It is clear that some of the rounded masses are seen as surface outcrops by the erosion of the surrounding granite at a comparatively recent date.

The microscopic structure of this rock, as shown by a selection from the numerous thin sections which I have prepared from different outcrops is as follows:

(1). From Eastern Point; midway between Bass Rock and Brace's Cove: Orthoclase, quartz, chlorite, uraninite, magnetite, numerous small grains of titanite. With a high power objective, under crossed nicols the feldspar and quartz present the appearance of a mosaic. The feldspars are microperthite intergrowths of albite and orthoclase.

(2). From the outer side of Salt Island: Micropegmatitic quartz and feldspar grains, the feldspar grains being tabular Carlsbad twins (always microperthite), augite, green hornblende, some biotite, magnetite, iron pyrite, and large sections of colorless garnets in the micropegmatitic quartz and feldspar areas. With high power objectives, even the smallest feldspar grains are seen to be microperthite. There are, also, some micro-zircons as inclusions in the feldspars. The entire section shows that the rock has been subjected to great strain, for much of the hornblende, and some of the feldspars are crushed and broken. Decomposition in the hornblende has produced feathery-formed glaucophane.

(3). Near Brace's Cove, southeast: Quartz feldspars, hornblende, chlorite, glaucophane, limonite. The quartz and feldspars are arranged as in the other slides. The orthoclase which is microperthite, micropegmatically arranged, has inclusions of hornblende, limonite and quartz grains. The evidence of great strain and crushing force, sufficient to separate the quartz grains from the feldspars, is easily detected. In many cases a rim of chlorite surrounds each grain, while in some instances the limonite surrounds the quartz and feldspar grains, giving the section the appearance of a clastic rock, usual in all of the granulites.

Many micro-sections of this rock from various outcrops have been studied, and the results all point to the conclusion that this extensive formation in the Cape Ann hornblende-granite area has a granitic structure, and has crystallized from the magma in an aggregate of small grains, partially metamorphosed by plastic deformation subsequent to solidification, a secondary metamorphism having taken place through great pressure and strain from causes yet to be determined, but probably due to faulting as shown on the coast line in this contact, and which gives the rock its granulitic structure.

C. Remains of Ancient Rocks of Sedimentary Origin on Cape Ann.

(1). The principal and largest mass of this sedimentary rock, referred to in my previous paper on the stratified rocks of Essex County (Bull. Essex Inst. Vol. XXII No. 1, 2 & 3, p. 45, Min. and Geol. Notes 2), is seen on the shore at the westerly side of Folly Point, east of Langford's Cove, in Lanesville. This outcrop varies in width from 10 to 30 feet; the strike is N. 40° E. to S.W.; the length of the outcrop, exposed between low water and the covering of drift on the hillside, is about 100 yards.

The microscopic structure is: Well rounded grains of quartz and feldspar, scales of biotite, some titanite, garnets with irregular outline and some magnetite. The larger feldspars have inclusions of muscovite, quartz and epidote and are surrounded by chlorite. This rock is clearly a mica-schist, metamorphosed from a sandstone.

(2). Another outcrop of this mica-schist, which is interbedded with a granitic gneiss and chert, is seen in an abandoned quarry in the Bay View region. It has the same dip and strike as the outcrop at Lanesville. This gneiss has the same microscopic characters as the gneiss of Boxford and Andover, and farther investigation will undoubtedly show that this rock belongs to the lower Cambrian sediments, thus placing the so-called archæan-gneiss, found in the large tract in the northern part of the county, in this group.

(3). On both sides of Brace's Cove, Eastern Point, Gloucester, is a clearly metamorphosed sedimentary rock of irregular outline, and of considerable extent, with a strike N. and S. to N.E. and dip nearly vertical, and which is also seen as inclusions in the hornblende-granite of the region. The microscopic structure is: Rounded and irregular grains of quartz and feldspars cemented in a groundmass of chlorite and limonite.

At the suggestion of Dr. J. E. Wolff, a comparison was made between thin sections of this rock and some from the Penokie Gogebic Series (Michigan and Wisconsin) of Van Hise. (Am. Jour. Sci., 3d Ser., Vol. 31, 1886, p. 453.) The resemblance is marked, although Prof. Van Hise finds the rock in limited quantities, and in a very different region, geologically. These rocks appear to belong to the same series, which in the case of our rock is clearly Cambrian.

(4). Another extensive outcrop of these metamorphosed sedimentary rocks is seen in Essex, in the valley between White and Powder House hills and extending across Essex to Conomo Point. Here the slates, which are distinctly interbedded with granitic gneiss and quartzites, are in places filled with garnets varying from microscopic size to one-fourth of an inch in diameter, thus these slates have been metamorphosed into garnetiferous gneiss, a form not before noticed in our Essex County rocks excepting in boulders on Cape Ann and Nahant. As the two regions last named are in direct line with the variations of the glacial striæ on the surface of the rocks throughout the county, it may be presumed that these isolated boulders are remnants of glacial material originating in this outcrop in Essex.

It seems important to call attention to these points, especially in regard to the first two deposits (A and B), which occur in large areas on Cape Ann, for they are confounded with the hornblende-granite in the report on the Geology of Cape Ann (U. S. Geol. Surv., Ninth Rep., 1887-88).

Peabody Academy of Science, Aug. 13, 1892.

FOLK SPEECH OF YORKSHIRE AND NEW ENGLAND.

BY H. M. BROOKS.

Some two or three years ago Mr. William Andrews, the noted Antiquary of Hull, England, sent me a book on the "Folk speech" of East Yorkshire.¹

Upon an examination of this volume I was struck with the fact that there were a great number of words and sayings, said to have originated in, or to have been in use in Yorkshire, which are common in New England. My present purpose is not to make particular reference to the peculiar dialect of old Yorkshire but merely to note some of the words and phrases that we use in common every day conversation, which would appear to have come to us from Yorkshire originally.

Among the common East Riding Yorkshire similes, I will mention the following which it will be seen are more or less in use in *our* Folk speech.

As black as a Crow (crow).

As blind as a bat.

As bright as a button.

As cawd (cold) as ice.

As clean as a whistle. — Clean here means complete, perfect or clear, and refers to the sound and not to the

¹The Folk speech of East Yorkshire.—By John Nicholson (Hon. Librarian Hull Literary Club. 12mo. London. Simpkin Marshall & Co. 1889.

whistle itself. Just as in "as clear as a bell" the word clear refers to the sound and not the instrument causing the sound.

As dark as pitch.

As deead as a deear nail. (In Piers' Plowman, As dead as a door nail.)

As deead as a herrin. (As dead as a herring.)

As deef as a yat stowp (gate post).

As fat as a pig.

As flat as a pan-keeak (cake).

As full as a tick.—A *tick* is a sheep-louse, which has always a full bloated appearance.

As good as ivver (ever) stepped upo' shoe leather.

As good as they mak' 'em.

As green as gess (grass).

As grey as a badger.

As green as a yellow cabbage—Used when any one assumes innocence or ignorance.

As happy as the day is lang (long).

As heavy as leead (lead).

As holla as a dhrum (as hollow as a drum).

As keeal as a coo-cummer (as cool as a cucumber).

As leet (light) as a feather.

As mad as a March hare.

As mischievous as a monkey.

As mony (many) lives as a cat.

As pawky as you please.—*Pawky* means impudent.

As poor as a chotch moose (church mouse).

As sharp as a needle.

As snug as a bug iv (in) a rug.

As still as a mouse.

As stunt as a mule—*Stunt* means obstinate or dogged.

As sweet as a nut.—Here sweet means sound and wholesome.

As thin as a wafer.

The dialect of East Yorkshire contains in abundance words expressing fighting or quarrelling. Mr. Nicholson calls them "Bellicose words."

I will mention a few words that are common here.

Baste—meaning to beat or flog such a person, we say—"Ought to have a good basting."

Bat—a rap or blow. "Give him a bat over the head for his impudence."

Bung up—to close as with a bung, "Bung his eyes up."

Catch it—to meet with punishment, "He'll catch it when he gets home."

Chip—a slight quarrel, "Knock that chip off of my shoulder."—boys used to say.

Crack—a stunning blow, "I fetched him a crack."

Cuff—a blow with the cuff or fore arm. "Cuff him over the head."

Dab—a stroke in the face. "Give him a dab."

Dhrissin (dressing)—a flogging. "Give him a good dressing."

Dhrub (drub)—to flog. "He got well drubbed."

Dig—to poke with a stick, etc. "He gave me a dig in the ribs."

Dust—a quarrel. "To kick up a dust."

Fetch—to deliver a blow.

Hammer—to flog severely with some instrument. "Hammer him well."

Haze—to beat. "He got a hazing."

Hiding—a flogging on the *hide* or back.

Lam—to beat. "A good lamming."

Let Dhrave (drive)—to strike with full force.

Lick—a chastisement. "If he don't look out he'll get a licking."

Plug—to strike with the fist. "Plug up his mouth, or nose."

Pummel—to strike with the fist.

Rap—a quick blow.

Set teeah (a set to)—a regular fight.

Spank—to flog. "If she'd had a good spanking when she was young, she would have been better."

Thresh or *Thrash*—to beat.

Thump—to strike heavily on the back.

Wale—to beat with a stick or cowhide sufficiently hard to make "wales."

Whack—to beat.

Whipe—a stinging, sliding blow.

A FEW OTHER WORDS.

Bent—determined. "He's bent on doing wrong."

Black and blue—discoloured by an injury.

Bluther (blubber)—to cry.

Botch—work of an unskilful workman. "Jack is a regular botch."

Cap—to surpass. "Capped the climax."

Clack—noise, gossip, persistent talk. "Hold your clack."

Flay—to frighten, to make afraid.

Full Smack—head long, heavily, with determination.

Grease—gain, profit, advantage.

Grub—to toil, to delve.

Heep (heap)—a great number of persons or things.

Leave—soon, rather. "I'd as leave do this as that."

Possessed—held, controlled. "I don't know what possessed me."

Purchass—leverage, advantage. "I must get a good purchase upon it before I can lift it."

Render—to make run, to melt.

Sag—to bend, to droop.

Settle—bench with a high back, used in front of an open fireplace, generally in old kitchens.

Shanks—ankles, legs. "Now then, spare shanks (thin legs) get out of the gate."

Smatch (smack)—a flavor or taste.

Snape (snub)—to check, to correct, etc.

Spigot—a vent peg, in liquor barrels.

Stagger—to bewilder. "It staggers me, when I think of what he is doing."

Swap—to exchange; to barter.

Swill—to swallow greedily. "He *swills* down the coffee and makes a *swill*-tub of himself with the food."

Tend—"tends pigs, cows, etc., tends store."

Tickle or *Ticklish*—a delicate matter or job. "It is rather a ticklish thing to do."

Tree—anything made of wood, as cross-tree, boot-tree, axle-tree, etc.

Ugly—horrible, dreadful, disagreeable. "An ugly place to drive in."

Some of these words may be said to be common anywhere, but they are all used in East Yorkshire, and must of course have been used there before they were used here. I have not pretended to look very closely into the subject but hope this may induce some one with more ability to follow it up and give us a carefully prepared article. The object of this is simply to call attention to the connection of our folk speech with that of England.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 25. SALEM: APRIL, MAY, JUNE, 1893. Nos. 4, 5, 6.

REPORT OF COMMITTEE ON COLUMBIAN EXPOSITION.

On Monday, December 21, 1891, at a regular meeting of the Essex Institute, the subject of making an exhibit at the World's Columbian Exposition at Chicago was discussed and the Historical Committee was empowered to ascertain what arrangements could be made with the Massachusetts Commissioners in relation to it. At a meeting of the committee, January 9, 1892, it was voted that all preliminary arrangements in relation to having the Institute represented at the exposition should be left to a sub-committee of ten, and at a subsequent meeting two more members were added.

On January 15, 1892, Mr. E. C. Hovey, Secretary of the Board of Massachusetts Commissioners met by request with the Institute Committee, described the Massachusetts State building and approved of the plan of the Institute to furnish one room. On March 30, 1892, Mr. Hovey was present at a meeting of the Committee and exhibited the architect's plan of the Massachusetts State building and offered the main reception room to the Institute, the Committee to have full charge of furnishing it.

December 17, 1892, Prof. F. W. Putnam was invited to address the Institute with a view of awakening an interest in the Exposition. His subject was "The Scientific Side of the Columbian Exposition," and he gave a full account of the Ethnological and Archæological exhibits to be under his charge.

Owing to various causes no active steps were taken in relation to the Institute's exhibit until January 9, 1893, when, at a meeting of the Committee, it was voted to issue the following circular :

ROOMS OF THE ESSEX INSTITUTE,

JAN. 20, 1893.

"The Essex Institute has been offered the privilege of furnishing one of the Reception Rooms in the Massachusetts State Building at the Columbian Exposition at Chicago, and the undersigned have been appointed a committee to procure such articles as are needed, and to make all arrangements for the Institute exhibit.

The size of the room allotted for this exhibition precludes the possibility of having a very large collection, but the articles selected should be of the highest historic and artistic interest. The committee therefore appeal to all who may be interested in this matter, and ask for the loan of furniture, old china, historic relics and documents, and for contributions of money, to aid in properly carrying out their plans.

The furniture offered should be choice examples of the genuine colonial style, and the articles loaned should, first of all, be of interest from their connection with Massachusetts history.

Any person desiring to aid the committee, by the loan of articles, is invited to send a description of them to the rooms of the Institute, when some member of the committee will examine them at an early day and report on their fitness for the exhibit.

All articles accepted will be insured, and every effort will be made to protect them from injury. They will be returned, in due time, without charge to the contributors. As it is necessary to have the entire exhibit arranged before the end of March it is desirable that contributors should notify the committee of proposed loans without delay.

The desirability and importance of having at Chicago a characteristic exhibit from Salem, both from the historic fitness of things and from the standpoint of present business interests, have impressed all those who have considered the matter, and the committee hope that our citizens will join in making this exhibit, which will be so well located for public inspection, just what it should be.

There will be a considerable expense involved in providing frames for pictures, for preparing copies of portraits, etc., and for many items connected with placing the collection in a proper condition for exhibition, and contributions to this expense fund will be very gratefully received, as the Institute has no means which may properly be used for the purpose.

Subscriptions to the expense fund can be sent to the Secretary of the Institute, by check or otherwise, when a suitable acknowledgment will be made."

It was also voted at the same meeting to arrange for an excursion to the Exposition and on February 1, 1893, the committee sent out the following circular :

"In response to many requests the Essex Institute has arranged with Messrs. Raymond & Whitcomb to run one of their special trains of Pullman Palace cars directly from Salem to the Exposition grounds, at Chicago. These trains, comprising both sleeping and dining cars, are of the best class and have every attainable appointment for the safety and comfort of travellers. The Salem party will be guests at the new hotel, the Raymond and Whitcomb Grand, situated on Washington and Madison Avenues and fronting the Midway Plaisance, and near one of the main entrances to the Fair grounds. This hotel has been built specially for the Raymond & Whitcomb parties, and is in every way a modern, first-class house. It is fire proof, only four stories high, and has with the rooms, connecting bath and toilet arrangements. Oscar G. Barron, of White Mountain fame, is the manager, which is a guarantee for the best of table service and general management. The date of departure from Salem will be Saturday, A. M., May 27; Sunday will be passed at Niagara Falls,— and Chicago will be reached Monday, at 6 P. M.

Tickets for the entire trip are one hundred and twenty-five dollars, which includes a whole sleeping berth, half a section in

Pullman car, meals in dining car each way, transfer of person and baggage to the hotel, twelve admissions to the Fair, and seven days at the Raymond & Whitcomb Grand. Returning, the party leaves Chicago June 5, at 3 P. M., reaching Salem the 7th. Visitors to the Exposition in the Raymond & Whitcomb parties have many advantages over the ordinary traveller: Transit on Pullman cars, meals at regular hours in dining cars, alighting at a private station, transfer at once to the hotel near by, a room pre-engaged and ready for occupancy, and freedom from the annoyance and crowd incident to ordinary travel on occasions of public interest.

Only a limited number can be accommodated, and early application for places is necessary. Plan of Pullman cars may be seen and circulars of the trip obtained at the Institute rooms.

The Essex Institute has no pecuniary interest in this excursion, and it assumes no responsibility in any way. All the details are under the well known management of Messrs. Raymond & Whitcomb, and may be safely left in their care."

On February 27, 1893, Mr. Alfred Stone, of Providence, was invited to lecture before the Institute. This lecture was given at Academy Hall, admission to which was had by tickets distributed at the rooms of the Institute. The subject was "The White City." It was fully attended and was illustrated by beautiful lantern pictures giving views of the buildings at Jackson Park and many architectural details, etc. Mr. Stone's lecture was so graphic and entertaining and his enthusiasm in regard to the artistic beauty of the buildings was so genuine that he awakened the first real practical interest in the exhibition and the public became somewhat aroused in regard to it.

At a meeting of the Committee on March 17, 1893, the general plan of the exhibit was agreed upon as follows:

(1) An exhibit in connection with the Peabody Academy of Science in the Marine Division of the Transportation Department.

(2) An exhibit of the publications of the Society in the Department of Liberal Arts.

(3) To aid as far as possible the Government Exhibit in the Department of Justice.

(4) To furnish the Reception Room in the Massachusetts State Building with portraits, paintings of old houses, collection of Salem views suitably bound in albums, furniture of the early and later colonial periods, cases of historical relics illustrating as far as possible the different departments of the historical work and collections of the Institute.

Mrs. Grace A. Oliver and Mrs. H. M. Brooks were appointed a committee, with power to add to their number, for the purpose of aiding the regular committee in soliciting articles for exhibition, etc.

The collection of pictures, consisting of original paintings, copies by Mr. Ross Turner, photographs, etc., making up the Transportation exhibit was put on public exhibition at W. H. Gardner's, Essex St., and attracted instant and widespread attention. It was followed by an exhibition, at the same place, of the portraits for the State Building; these also were received with public favor. The articles were boxed and packed under the supervision of Mr. Treadwell, janitor of the Peabody Academy of Science, and Messrs. Ross Turner, A. R. Stone and J. R. Treadwell took charge of arranging and installing the exhibits at Chicago.

Whether or not, the committee has succeeded in getting an exhibit worthy of the city and county, illustrative of our local history, and redounding to the credit of the Society, a visit to the Exposition alone can tell. The committee present this catalogue somewhat hastily prepared, as a report of its doings. It cannot, however, close without a word of appreciation of the earnest work done by one of its number, Mr. F. H. Lee, to whom was relegated the most ungrateful of tasks, that of collecting contributions of money. His enthusiastic labors in season

and out, the giving so freely of his time and energy to this task have been a constant incentive to the remainder of the committee, whose burdens have been much lighter, and whatever of merit the exhibit may possess the rest of the committee feel is largely due to him.

Robert S. Rantoul, *Chairman*.

Daniel B. Hagar,	John Robinson,
Ross Turner,	Eben Putnam,
David M. Little,	Thomas F. Hunt,
Francis H. Lee,	Walter J. Stickney,
Winfield S. Nevins,	George M. Whipple,

Henry M. Brooks, *Secretary*.

CATALOGUE.

TRANSPORTATION BUILDING.

Marine Division—Section E Gallery, Col. 32.

MARINE EXHIBIT.

The Essex Institute and Peabody Academy of Science united in making this exhibit. Lt. A. C. Baker, in charge of the Marine Division of the Transportation Department of the World's Columbian Exposition visited Salem and made a careful examination of the cabinets and collections of both institutions and at his suggestion the committee arranged to exhibit in this Division. The contributions of the Peabody Academy of Science, consisting largely of photographs of its ethnological collections, were made with the view of showing the methods employed in its museum for displaying the marine architecture and means of transportation of different nations. The Institute exhibit was in the line of its local historical work, giving an idea of the style of vessels engaged in the commercial interests of Salem from 1765 to the present day. To this were added certain pictured representations typical of events which happened in the marine history of Salem.

“Salem may justly be proud of her Commercial History. No other seaport in America has such a wonderful record. Flying from the mast of a Salem ship the American flag was first carried into the ports beyond the cape of Good Hope. Her

vessels led the way from New England to the Isles of France, India and China, and were the first from this country to display the American flag and open trade at St. Petersburg, Zanzibar, Sumatra, Calcutta, Bombay, Batavia, at Arabia, Madagascar and Australia, and at many other distant ports. Well may she proudly inscribe on her city seal 'Divitis Indiae Usque ad Ultimum Sinum.'” C. S. Osgood, Hist. of Essex County: Salem: p. 63.

EXHIBIT OF THE PEABODY ACADEMY OF SCIENCE.

Ship "America." Oil painting. Artist unknown.

The America was built for George Crowninshield and Sons by Retire Becket in 1804. She registered 450 tons. Cut down and fitted as a privateer during the war of 1812, she was noted for her great speed and good fortune. She made four cruises, the first under command of Joseph Ropes, the third and fourth under command of James Cheever, Jr. She brought in prizes to the value of upwards of one million of dollars.

Ship "Margaret." An oil painting by Benjamin West, a local artist of Salem; made about 1838 from an original picture.

The Margaret was built by Retire Becket in 1800 and registered 295 tons. Owned by George Crowninshield and Sons and commanded by Samuel Derby she was the first Salem and second American vessel to visit Japan where she went with the Dutch East India Company's freight from Batavia in 1801. Mr. George Cleveland the clerk of the ship published a most interesting narrative of this voyage. The Margaret was lost under peculiarly distressing circumstances in 1810.

Ship "Hazard." An original water color by E. Corné painted in 1805.

This was the second vessel bearing the same name and was built by Retire Becket for J. & R. Gardner in 1799. She proved one of the best ships built in Salem at the time and was engaged in the East India trade.

Ship "Propontis." Owned by Tucker Daland of Salem in 1844.

A characteristic model of vessels of that period. She was engaged in the Zanzibar trade.

Ship "Panay." A photograph of the ship leaving port.

The Panay was built in 1877 for Silsbee and Pickman and registered 1131 tons. She was engaged in the Manila trade and was lost a few years since in that region.

Photographs of models of the hulls of European vessels of the fifteenth and sixteenth centuries, including one of the vessels of the fleet of Columbus.

Photograph enlarged from an early print, and retouched in India ink, of the "Sovereign of the Seas," built at Woolwich, England, in 1638, representing a vessel of the seventeenth century.

Photograph of the model of the hull of a Venetian vessel of the eighteenth century, showing the broadside, bow and stern.

Solar print, five by four feet, enlarged from a photograph made by Mr. A. W. West, of the Marine Trophy in the East Hall of the P. A. S. (end view), showing full rigged models of the U. S. frigate "Constitution" presented to the East India Marine Society of Salem by Commodore Isaac Hull in 1813 and which was repaired, as shown by a receipted bill in possession of the Academy, by "British Prisoners of War" who in 1814 were confined near Salem; the ship "Friendship" built in 1797; the brig "Camel" a prize of the war of 1812; brig "Rising States" owned by William Gray in 1802, old and modern fishing schooners, etc. Also models of an African "slave dhow" and a New Zealand war canoe; a full size North American Indian birch bark canoe and Esquimaux "Kyak," besides other vessels not well shown in the photograph. On the floor beneath rests a palanquin used in Calcutta, a gift to the Museum from four merchant captains who met in that city and obtained it in 1803.

Photographs giving side views of Marine Trophy in East Hall of the P. A. S.

Photograph of models of Chinese vessels in the collection of the P. A. S. showing old style "Junk," Formosa fishing boat, war boat of old class, trading and house boats.

Photograph of models of vessels from Polynesia, India, Philippine Islands, Japan, etc., in the collection of the P. A. S. showing Fiji double war canoe, a trading boat,

trading vesels of Manila, Singapore "fast boat," Travancore racing boat, Japanese trading junks and smaller craft.

Photograph of Brazilian "catamarans" in the collection of the P. A. S. Several forms of these raft-like vessels peculiar to the region of the Amazon.

Framed document—a pass permitting the American schooner "Jack" to enter the Mediterranean sea in 1797, signed by President John Adams, etc.

Clearance paper.

Dimensions of the frigate "Essex" made out in the hand writing of Enos Briggs, the builder, in 1799.

Bark "Glide." An oil painting. *Loaned by Mr. James B. Curwen.*

The "Glide" was built in Salem in 1861 for Messrs. John Bertram, Curwen and others, and was engaged in the Zanzibar trade.

Brig "Mexican," attacked by pirates. An oil painting by George Southard. *Loaned by Mr. John Battis.*

In August, 1832, the brig "Mexican" left Salem for Rio Janeiro having on board \$20,000 in specie. On Sept. 20 she was captured by the piratical Spanish schooner "Pinda," rifled of her specie, her crew fastened between decks and flrê set to the vessel. The crew of the "Mexican" managed to get on deck and extinguish the fire, repair damages, and Oct. 12 reached Salem. Aug. 27, 1834, the H. B. M. "Savage" arrived at Salem with sixteen of the pirates as prisoners. Five of them were hanged June 11, 1835. The owner of this painting, Mr. John Battis of Salem, is one of the thirteen men who formed the crew of the "Mexican." The "Mexican" was built in Salem in 1824 by Elijah Briggs for Joseph Peabody and registered 227 tons.

Ship "Mt. Vernon," off Gibraltar. An original water-color painted in 1799. *Loaned by Messrs. Ropes Brothers.*

The "Mt. Vernon" was built by Retire Becket in 1798 for Elias Haskett Derby and registered 398 tons. Equipped with twenty guns and a crew of fifty men, under the command of E. H. Derby, Jr., sailed from Salem with a cargo of sugar. Off Cape St. Vincent she was attacked by a fleet of French vessels from which she escaped by superior sailing and fighting qualities. She returned from Naples in 1800 with a cargo of wines and silks. See Osgood's Commerce of Salem, Hist. Essex Co., Vol. I.

Ship "Mt. Vernon" escaping from the French fleet.

Loaned by Messrs. Ropes Brothers.

Coasters in Salem Harbor. A water-color sketch by Miss Mary K. Robinson. *Loaned by Mr. John Robinson.*

During the continuance of an easterly gale coasting schooners put into Salem as a harbor of refuge, where they remain for favorable wind and weather. The sketch represents a fleet of such vessels getting ready to sail on a morning after a storm.

"Chesapeake" and "Shannon." Painted by Ross Turner.
Loaned by Mr. T. F. Hunt.

This pastel sketch was made by Mr. Turner as a study for a more important painting of the contest between the "Chesapeake" and "Shannon." This engagement took place June 1, 1813, so near the shores of Salem that many persons witnessed it from the heights in the vicinity. The Chesapeake was captured and taken to Halifax from which place the body of her young commander, Lawrence, and that of Lieutenant Ludlow were brought to Salem and buried with great honors. The dying message of Com. Lawrence, mortally wounded in the progress of the fight, "Don't give up the ship," has become historic.

Circle. By Gambey, Paris. *Loaned by Mr. W. J. Stickney.*

A nautical instrument used in getting the sun's altitude.

EXHIBIT OF THE ESSEX INSTITUTE.

WATER COLORS.

Ship "Erin." Original painting.

The "Erin" was engaged in the India and China trade about 1819 at which date she brought cargoes to Salem to Henry Pickering.

Ship "Sally." Original painting.

The "Sally" was owned by George Crowninshield and Sons and was engaged in the India trade in 1803.

Schooner "Baltick," in 1765. Painted by Ross Turner from the original in possession of the Institute.

Felt says the name of schooner originated in Gloucester in 1709. No mention of the Baltick occurs in Osgood's Commercial History of Salem, but she was engaged in trade with the West Indies.

Brig "Gov. Endicott." Painted by Ross Turner from original in possession of the Institute.

The "Gov. Endicott" was built in Salem in 1819 by Elijah Briggs for Pickering Dodge. Originally rigged as a ship and dismasted on her first voyage she was repaired as a brig.

Bark "Eliza." Painted by Ross Turner from original in possession of the Peabody Academy of Science.

She was built in 1822 by Thomas and David Magoun for Joseph White. She was sold to David Pingree in 1832 and again to Michael Shepard in 1846. This vessel was one of the earliest engaged in the California trade, being the first vessel of her size, 240 tons, to ascend the river to Sacramento. Capt. Augustine S. Perkins was in command at the time; she remained as a store ship at Sacramento and was sold and broken up in 1868.

Ship "Margaret." Painted by Ross Turner from the

original, drawn to scale, in possession of the Peabody Academy of Science. (For full account of the "Margaret" see previous pages.)

She sailed for Sumatra Nov. 19, 1800, with \$50,000 in specie, 12 casks of Malaga wine and 2 hogsheads of bacon.

Ship "Friendship." Painted by Ross Turner, from original, in possession of the Peabody Academy of Science.

The "Friendship" was built in Salem in 1797 by Enos Briggs for Messrs. Pierce and Waite. Capt. Israel Williams commanded her on several noted voyages to China, Batavia, etc. She registered 342 tons. This ship was always very fortunate and cleared \$200,000 on an investment of 50,000. (See also full rigged model shown in solar print.)

Ship "Prudent." Painted by Ross Turner from original in possession of the Peabody Academy of Science.

She registered 214 tons and was built in Salem in 1799 by Ebenezer Mann for Nathaniel West and others. While commanded by Capt. Benjamin Crowninshield the "Prudent" was captured by a French man of war and vessel and cargo confiscated. In 1803 the "Prudent" entered Salem from Messina with 11,406 gallons of red wine, 6,413 gallons of white wine, 4,303 gallons of brandy and 9,810 pounds of soap.

Frigate "Essex." Painted by Ross Turner from original in possession of the Peabody Academy of Science.

She was built in Salem, through a popular subscription from Salem' merchants in 1799, by Enos Briggs. She registered 850 tons, mounted 32 guns and was in command of Captain Preble. She proved the fastest vessel in the U. S. Navy and captured property to the value of 2,000,000. The late Admiral Farragut was a midshipman on the "Essex." It is said that the original of this picture, which is signed "Joseph Howard," is the only one now extant of the "Essex." See full account of the "Essex," Hist. Coll. Essex Inst.

Ship "George." Painted by Ross Turner from original in possession of Peabody Academy of Science.

The "George," 328 tons, was built in 1814 for a privateer by an association of ship carpenters thrown out of employment by the war with Great Britain. She was bought by Joseph Peabody and made twenty voyages to Calcutta and return between 1815 and 1837. She was very fast, and very fortunate, never having lost a spar or met with an accident while owned by Mr. Peabody who made more than half a million dollars in this one vessel. In a manner she was looked upon as a nautical academy, many of Salem's young men shipping in her before the mast and graduating from her as mates and masters.

Ship "John Bertram." Painted by Ross Turner from original in possession of Peabody Academy of Science.

The "John Bertram," 1100 tons, built at East Boston in 1850, by Elwell and Jackson for Glidden and Williams, Capt. John Bertram and others. She is said to have been the first American clipper ship built *expressly* for the California trade. She was pronounced one of the finest modelled and most thoroughly constructed vessels that ever floated on our waters. She was built and launched in sixty days.

PHOTOGRAPHS.

Ship "Mindoro."

960 tons, built at East Boston 1864, owned by Pickman, Silsbee and Allen. Last full rigged ship hailing from Salem. Now engaged in the Manila trade.

Topsail-Schooner "Plato." From a painting made in 1835, in possession of Peabody Academy of Science.

Built by Enos Briggs for Isaac Cushing and others 1816. Dimensions 78 2-12 x 22 10-12 x 8, 125 tons.

Ship "John." From original painting in possession of Essex Institute.

The "John" 258 tons, built by Enos Briggs for Elias Haskett Derby. She was ketch rigged at first and altered into a ship in 1799. Her dimensions were as follows: length of keel 75 feet, beam 25 feet, depth of hold 9 1-2 feet. Engaged in the India trade 1796, Sumatra trade 1807, and bought by George Crowninshield & Sons in 1812 for a privateer.

Launch of Ship "Fame." From original painting in possession of Essex Institute.

The "Fame" built in 1802 by Retire Becket for George Crowninshield & Sons 363 tons burden. In 1804 she visited the coast of Cochin China in search of sugar.

Crowninshield's Wharf. From painting by Geo. Ropes in possession of Essex Institute.

Showing Crowninshield's fleet at the wharf during the first embargo.

Whaling Scene in South Atlantic. From painting by Benj. F. West in possession of Essex Institute.

Showing bark "Richard," of Salem, and other vessels engaged in whale fishing.

Models of English Frigates. From the original models in possession of the Essex Institute.

Made by American prisoners at Dartmoor prison.

Ketch "Eliza." From the original model in possession of Essex Institute.

"Eliza" built by Enos Briggs in 1794 for Elias Haskett Derby. Dimensions 93 x 25 x 9, 184 tons burden. First vessel to arrive at Salem direct from Calcutta Oct. 8, 1795 with a cargo of sugar. Dec. 22, 1794, she sailed for the East Indies with a cargo consisting of forty-eight casks of brandy, twenty-two barrels naval stores and one hundred and six pairs silk stockings.

Instrument for getting ship's reckoning by the North Star.	} From the originals in possession of the Essex Institute.
Instrument for taking lunar observations.	
Style of quadrant in early use.	
Sextant used by Nath'l Bowditch.	

MANUFACTURES AND LIBERAL ARTS BUILDING.

Department of Liberal Arts Gallery E, Sec. I.

PUBLICATION EXHIBIT OF ESSEX INSTITUTE.

Proceedings of the Essex Institute. Six volumes, 1848 to 1868, containing account of meetings of Society and scientific papers.

Bulletin of the Essex Institute. Twenty-four volumes, 1868 to 1893, a continuation of the Proceedings; contains reports of meetings and specially prepared papers of scientific value.

Historical Collections. Twenty-eight volumes, containing papers of historical, genealogical and biographical interest, town and church records, anniversary addresses, memoirs of distinguished persons, etc.

Bound in cloth and leather, the leather especially prepared by Alphonse Mouthuy, Salem.

Also among other special publications and reprints of the Essex Institute, the following :

HISTORICAL.

Commemorative exercises on the fifth half century of the landing of Endicott.

Salem Town Records 1634-1659, 8vo.

Salem : Historical sketch by C. S. Osgood and H. M. Batchelder.

Adams, Herbert B. Commons and commoners of Salem, parts 1-6.

Blodgett, George B. Early settlers of Rowley.

Blodgett, Geo. B. Records of deaths in first Church, Rowley.

Bentley, Wm. Parish lists of deaths, 1765-1819.

Emmerton, J. A. and Waters, H. F. Gleanings from English Records about New England families.

- Emmerton, J. A. Notes and extracts from Records of First church in Salem.
- Emmerton, J. A. Salem baptisms in the eighteenth century.
- Goodell, A. C. Centennial address, Oct. 5, 1774.
- Hawkes, N. M. Gleanings relative to the family of Adam Hawkes.
- Northend, W. D. Address before the Essex Bar association.
- Rantoul, R. S. Fifth half century of the arrival of Winthrop.
- Rantoul, R. S. Contribution to the history of the ancient family of Woodbury.
- Rantoul, R. S. Some material for a history of the name and family of Rentoul,—Rintoul,—Rantoul.
- Stone, E. F. Address on Gov. Andrew.
- Stone, E. F. Cushing, Choate and Rantoul.
- Upham, W. P. Records of the First church in Salisbury.
- Upham, W. P. An account of the Rebecca Nurse monument.
- Waters, H. F. Gedney and Clark families of Salem.
- Waters, H. F. Notes on the Townsend family.
- Waters, H. F. Newhall family of Lynn, Part I.
- Whipple, George M. Musical societies of Salem.
- Whipple, George M. Sketch of Salem Light Infantry.
- Willson, E. B. Memorial of J. C. Lee.
- Willson, E. B. Memorial of C. T. Brooks.

SCIENTIFIC.

- Fewkes, J. W. On the myology of *Tachyglossa hystrix*.
- Fewkes, J. W. Aid to a collection of the *Cœlenterata* and *Echinodermata* of New England.
- Gill, T. Primary subdivisions of the Cetaceans.
- Gill, T. Prodrôme of a monograph of the Pinnipedes (Seals) 1866.
- Garman, S. North American Reptiles and Batrachians.
- Garman, S. On West Indian *Iguanidæ* and on West Indian *Scincidæ* in M. C. Z., Cambridge, Mass.
- Goode and Bean. A list of the fishes of Essex Co., Mass.
- Ginsley, J. S. Carcinological notes, No. 5.

- Kingsley, J. S. On the development of the Crangon vulgaris (2d paper).
- Morse, E. S. Gradual dispersion of certain mollusca in New England.
- Morse, E. S. Ancient and modern methods of arrow release.
- Morse, E. S. Notes on the condition of zoölogy fifty years ago and to-day.
- Putnam, F. W. Remarks on some chipped stone implements.
- Putnam, F. W. Notice of an interesting relic of Mexican sculpture.
- Putnam, F. W. Indians of California.
- Robinson, John. Flora of Essex County, Mass.
- Robinson, John. Notes on the woody plants of Essex County.
- Robinson, John. Our trees.
- Upham, William P. History of the art of stenography.
- Upton, Winslow. Lecture on the eclipse of 1878.
- Wright, George F. Indian Ridge and its continuations.
- Wright, George F. The glacial phenomena of North America.

ART.

- Heliotype illustrations of Prof. Edward S. Morse's Japanese Pottery room, letter press description by Sylvester Baxter.
- Putnam, F. W. Conventionalism in ancient American art.
- Silsbee, Edward A. An informal talk on architectural and art topics.
- Rantoul, Robert S. Notes on the authenticity of the portraits of Governor Endicott.
- White, G. M. Etchings of the following places of historical interest in Salem and its vicinity:
- | | |
|----------------------------------|------------------------------|
| The Old First Church. | North Bridge. |
| Hawthorne's Birth-place. | The Head-quarters of General |
| Views from Beverly Bridge. | Gage. |
| Views of Beverly shore. | View from Winter Island. |
| Peabody Academy of Science. | Essex Institute. |
| The "House of the Seven Gables." | Pickering House. |
| | Dr. Grimshawe House. |

Gallows Hill.	Roger Williams House.
Harmony Grove Arch.	North Church.
George Jacobs' House.	Baker's Island.
Salem Custom House.	Rebecca Nurse House.

The Exchange list of the Peabody Academy of Science having in 1893 been united with that of the Essex Institute, and the scientific library of the former incorporated with that of the Institute the following publications of the Peabody Academy of Science are exhibited :

Memoirs, two volumes.

Reports, one volume.

Miscellaneous papers, one volume.

American Naturalist, nine volumes, 1867 to 1875.

With these are shown a collection of cards, notices and forms used by the Institute, and itineraries, guides, circulars of information, etc., issued for the benefit of visitors to Salem.

GOVERNMENT BUILDING.

Department of Justice.

At the request of Mrs. J. Ellen Foster, special agent of the Department of Justice, the committee had photographs made on plates 11 × 14 inches, of documents relating to the early history of Salem and the Colony of Massachusetts Bay, as follows :

Charter or Indenture under signature of Lord Sheffield, Jan. 1, 1623, to Roger Conant and others, from the original in possession of the Essex Institute.

The Endicott Charter. Charter March 4, 1629, from Charles I to Governor and Company of the Massachusetts Bay in New England from the original duplicate charter sent to Endicott, now in possession of Salem Athenæum.

Page of the first book of Records of Deeds, Essex Co., 1641, from the original at the Clerk of Courts office, Salem.

Roger Conant's will (first page) January 1, 1677.

Roger Conant's will (showing signatures).

Examination of Martha Corey for witchcraft, Mar. 21, 1692, from original document in possession of Essex Institute.

Examination of Rebekah Nurse for witchcraft, Mar. 24, 1692, from original at Clerk of Courts office, Salem.

Depositions of Ann Putnam and Ann Putnam, Jr. against Rebekah Nurse and others, May 31, 1692, from original in possession of the Essex Institute.

Indictment against Abigail Hobbs of Topsfield for "covenanting with the Devil;" in Casco Bay, 1688, from original in possession of Essex Institute.

Trial of George Jacobs. From the painting by Mattison in possession of the Essex Institute.

Appointment of Bartholomew Gedney, William Brown, John Hathorne and Jonathan Corwin as Justices of Inferior Court of Common Pleas, Oct. 16, 1696, William III; signature of Lt. Gov. Stoughton.

LEATHER AND SHOE TRADES BUILDING.

New England Shoe and Leather Department.

EXHIBIT MADE BY ESSEX INSTITUTE AT REQUEST OF
MR. CLINTON COLLIER, SUPT.

First shoe pegged by machinery.

First patent granted a shoe pegging machine given Mar. 8, 1833, to Samuel Preston, Danvers, Mass. This machine was arranged to put two rows of pegs upon each side of the shoe at the same time. It did not come into general use but the principle involved is found in all later machines.

Shoe and patten, made in London 1780 and worn in Salem soon after.

Shoe worn by a Salem belle at a Salem party about 1800.

Pair of slippers made in Salem in 1824.

Slippers, French style, purchased in Salem, 1819.

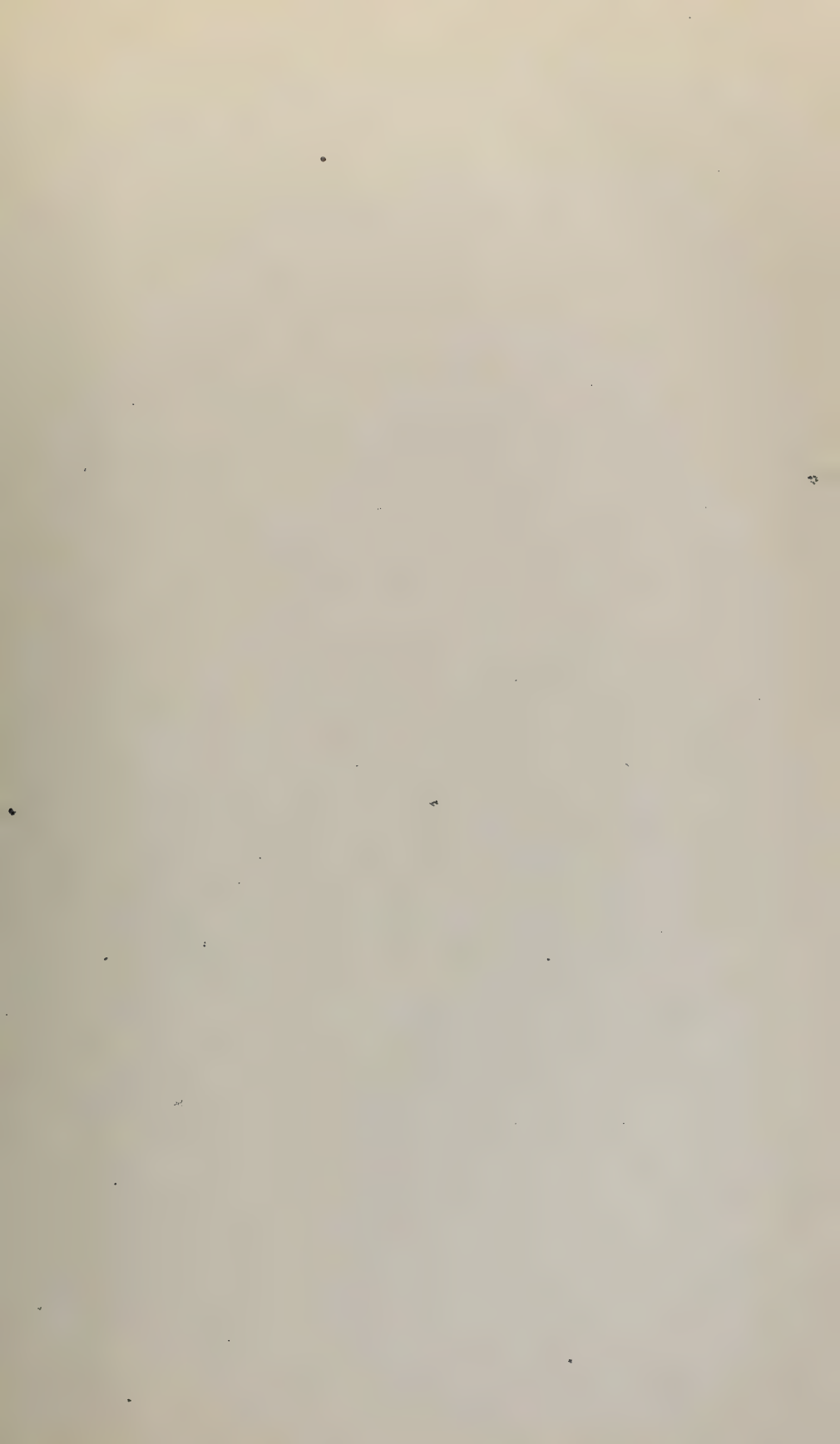
Patten, used before the introduction of rubber over-shoes.

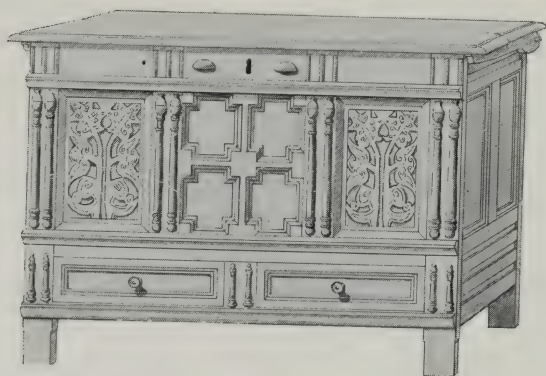
Infant's shoe, 1756.

Shoe worn by boy on Salem streets at a date prior to the Revolution.

Shoe worn by children of the present generation in mining district, Lancashire, England. Loaned by the Peabody Academy of Science.

Pocket book made and used in Salem prior to 1730.





"HEPPELWHITE"

"OAK CHEST."

"QUEEN ANNE."

MASSACHUSETTS STATE BUILDING.

Reception Room.

Mr. E. C. Hovey, the Secretary of the Massachusetts Board of World's Fair Managers, gave the Essex Institute full charge of fitting up and furnishing the main reception room in the state building. After consultation with him the committee decided to have the furniture illustrative of the period from the time of the first settlement of Salem until its commercial period at the beginning of the present century ; also to place upon the walls portraits of men whose names were familiar in state, commerce, law, science and literature. In addition, to have a display of historical relics which would, in a measure, show some of the historical work of the Institute and also give an idea of the directions in which it was hoped its collections would be increased. To these were to be added volumes relating to local history, albums of Salem views, and several volumes of the publications of the Essex Institute.

PORTRAITS.

John Endicott. Copy by Frederick P. Vinton, from the original portrait in possession of Hon. Wm. C. Endicott, of Salem. *Loaned by Mr. Wm. Endicott, Jr., Beverly.*

Endicott was born in Dorchester, England, 1588; arrived at Salem in the ship "Abigail," Sept. 6, 1628, as "Governor of the Plantation." In 1630, succeeded by Winthrop and took his seat as one of the Assistants. 1636, appointed Magistrate to hold the Salem Court, also Col. of Militia. In 1637, made one of the Standing Council for life. In 1641, Deputy Governor. In 1644, chosen Governor and served as such almost continuously until his death. In 1645, made Sergeant Major General, the highest military officer of the colony. In 1652, established a mint. Died in Boston, March 15, 1665. Location of his residence in Salem not accurately known, but was not far from the present corner of Washington and Federal streets. His farm in Danvers with pear tree planted by himself is still in possession of his lineal descendants.

Simon Bradstreet. Copy by Joseph DeCamp from the portrait in the Senate Chamber, State House, Boston.

Loaned by the City of Salem.

Born in England, 1603; died in Salem, March 27, 1697. Came to Massachusetts in 1630 as one of the Assistants. Made Deputy Governor in 1673. Governor in 1679. Served until 1686 when the charter was made void. Upon Sir Edmund Andros being deposed by the people in 1689, Bradstreet was again chosen Governor and continued in office until 1692. His house in Salem, taken down in 1755, stood upon the present site of the Armory of 2d corps of Cadets, Mass. V. M.

George Peabody. Painted by A. B. Schell. *Loaned by Mr. S. Endicott Peabody.*

Banker and philanthropist, born in So. Danvers, now Peabody, Feb. 13, 1795; died in London, Nov. 4, 1869.

Joseph Peabody. Painted by James Frothingham. *Loaned by Mr. S. Endicott Peabody.*

Born in Middleton, Mass., Dec. 9, 1757; went to Salem at the age of eighteen and joined the privateer "Bunker Hill" owned by E. H. Derby. Followed the sea for many years until 1791 when he began his mercantile career. Was engaged in the India, China, Straits and European trades as well as the West Indies and Spanish Main. Built eighty-three vessels. Died at Salem, Jan. 5, 1844.

John Bertram. Copy by Miss H. Frances Osborne from the painting by Dr. Edgar Parker, in possession of the Peabody Academy of Science. Essex Institute.

Born in the Isle of Jersey, Feb. 11, 1796. Came to this country in 1807 and settled in Salem. Followed the sea until 1832. Engaged in general commercial business. Especially interested in the Zanzibar, Madagascar, Arabian and California trades. Latter part of his life largely interested in the development of western railroads. Noted for his munificent gifts to local charities.

Manasseh Cutler, LL.D., M. C. 1800 to 1802. Copy by Miss A. W. Woodbury from the original portrait in possession of the Essex Institute.

Clergyman and botanist at Ipswich Hamlet (Hamilton); born in Killingly, Ct., in 1742 and died in Hamilton, 1823. Chaplain in Revolution; started the first party of emigrants to the Ohio. Made the first scientific description of the plants of New England.

Nathan Dane. Copy by Miss A. W. Woodbury of portrait in possession of Essex Institute.

Eminent jurist and statesman. Born in Ipswich, Dec. 27, 1752; died in Beverly, Feb. 15, 1835. Harvard University, 1778. Member of Congress, 1785-8. Held various state offices. Member of the Hartford Convention, 1814. Framer of the celebrated ordinance of 1787 for the Northwest Territory. Founder of the Law School at Cambridge.

William Gray, Jr. Solar print from portrait in possession of Peabody Academy of Science.

Born in Lynn, June 27, 1760. Entered counting room of Richard Derby at an early age. Became one of the largest ship owners in Salem; at one time said to be the largest in America. In 1807, owned fifteen ships, seven barques, thirteen brigs, one schooner, or one-quarter of the tonnage of Salem. Took great interest in politics and after removal from Salem became Lieut. Gov. of Mass.

Sir Richard Saltonstall. Engraving from the portrait by Rembrandt painted in Holland 1644 and now in possession of his lineal descendants. *Loaned by Mr. F. H. Lee.*

Saltonstall was born in Halifax, England, 1586; died in England, 1658. One of the grantees under the Council for New England. Came to this country with Winthrop.

Elias Haskett Derby. Copy by Joseph De Camp from portrait in possession of Peabody Academy of Science.
Essex Institute.

Born in Salem Aug. 16, 1729; died Apr. 8, 1799. One of Salem's most eminent merchants. His vessels were the first from New England to engage in the India and China trade.

Nathaniel Bowditch. Copy by Miss A. W. Woodbury from portrait in possession of Peabody Academy of Science.
Essex Institute.

Learned mathematician, born in Salem 1773. President of a Marine Insurance Co. in Salem 1804 to 1823, when he became Actuary of Massachusetts Hospital Life Insurance Co.; died in 1838 in Boston.

Joseph Story. Copy by Joseph De Camp from portrait in possession of Essex Institute.

Noted jurist and writer. Justice of United States Supreme Court. His law work comprises sixty-one volumes. Published a volume of poems in 1804. Born in Marblehead. Practised law in Salem many years. Died, 1845, in Cambridge, aged 66.

Nathaniel Hawthorne. Painted by Miss H. Frances Osborne from photograph taken at request of Mr. James T. Fields.
Essex Institute.

Author of *Scarlet Letter*, *Twice Told Tales*, etc. The most distinguished writer of Romance in America. Surveyor of Salem 1846-1850. In Boston Custom House 1838 to 1841. Born in Salem July 4, 1804; died at Plymouth, N. H., May 19, 1864.

Dr. William Paine. Photograph from painting. *Loaned by Mr. F. H. Lee.*

Physician in Salem and Worcester. Loyalist. During the Revolution absent in England. Introduced to George III. at Court in the costume in which portrait was painted.

Joseph B. Felt. Engraving. Essex Institute.

Born in Salem 1789; died there Sept. 8, 1869. Historian. Author of the *Annals of Salem*, *History of Ipswich*, *History of Essex*, *Life of Hugh Peters*, etc.

William Hickling Prescott. Engraving.
Essex Institute.

Born 1796; died 1859. Author of the *History of Ferdinand and Isabella* *Conquest of Mexico* and many other works. Born on site of Plummer Hall.

With this is framed an autograph letter, a photograph from engraving of his birthplace, and a photograph of Plummer Hall which now occupies the site of his birthplace.

Timothy Pickering. A miniature by George Southard after original by Gilbert Stuart. *Loaned by Mr. F. H. Lee.*

Born at Salem 1745; died there 1829. A prominent military and political character. Served through the Revolutionary War under Washington, and at its close was Secretary of War and Secretary of State. Was member of Congress and of the Massachusetts Legislature and held also various minor offices. One of the leaders of the Federal Party and noted for his honor and probity.

With this is framed a photograph of his birthplace, Broad St., Salem, built in 1651; an autograph when he was town clerk 1774; one when he was Secretary of State 1795, and a letter when member of Congress 1815.

Timothy Dexter. Engraving. Essex Institute.

Newburyport merchant, somewhat eccentric; called himself "Lord Timothy Dexter;" wrote pamphlets. Made a fortune by sending warming pans to the West Indies. Leather dresser by trade.

With this is framed a photograph, from engraving, of his residence and grounds with decorations, an autograph, and a reprint of his book, "Pickles for the knowing ones."

Henry Wheatland. Photograph. *Loaned by Mr. John Robinson.*

Born Jan. 11, 1812; died 1893. President Essex Institute. Distinguished for scientific, genealogical and historical knowledge.

Capt. George Curwen. Photogravure. *Loaned by Mr. John Robinson.*

Born in England 1610; died 1685. Old merchant, first of the name in this country. Lived in the Roger Williams house. Earliest of Salem merchants, was in the London trade previous to 1658; had four warehouses and two wharves in Salem and was owner of the ketches "George," "Swallow," "John," and "William."

Rev. George Curwen. Photogravure. *Loaned by Mr. George R. Curwen.*

Minister of First church, born 21 May, 1683; died 23 Nov., 1717; son of Capt. Geo. Curwen.

Abigail (Curwen) Hawthorne. *Loaned by Mr. George R. Curwen.*

Daughter of Capt. George Curwen. Ancestress of James Russell Lowell.

Maj. Stephen Sewell. *Loaned by Mr. George R. Curwen.*

Born Baddesley, England, 19 Aug., 1637; died 17 Oct., 1725. Clerk of the Courts at trial of the witches. Register of deeds for many years.

Margaret (Mitchell) Sewell. *Loaned by Mr. George R. Curwen.*

Wife of the above.

Samuel Curwen. Photogravure. *Loaned by Mr. Geo. R. Curwen.*

Distinguished Tory of the Revolution. Lived in London 1775 to 1784; author of Curwen's Journal and Letters written in London during his expatriation.

Charles W. Upham. Engraving. Essex Institute.

Born 1802; died 1875. Distinguished as clergyman, Member of Congress. Author of History of Salem Witchcraft. Well known as a political and historical writer.

Robert Rantoul, Junr. Lithograph. Essex Institute.

Born 1805; died 1852. Lawyer, member of Congress, political writer.

John Carnes. Photographed from the original portrait in possession of Essex Institute.

Commander of a Privateer during the Revolution.

Washington. From the original picture in possession of the Nichols family, Salem. *Loaned by Mr. F. H. Lee.*

Silhouettes. *Loaned by Mr. Chas. P. Bowditch, Boston.*

Merchants, lawyers, and divines of Salem, etc., viz.:

Mr. Jonathan Waldo.

Druggist and merchant in Salem; built, in connection with Wm. Stearns, the "Old Corner" building in 1792.

Col. Timothy Pickering.

Thomas Cushing, Esq.

Mr. Nathaniel West.

Merchant in Salem.

Judge Samuel Sewall (Marblehead).

Lawyer of distinction born in Boston 1757; died at Wiscasset, Me., 1814. Member of State Legislature. M. C. 1797-1800. Judge of Supreme Court and Chief Justice Nov. 1813.

Rev. Dr. John Prince.

Minister of First church from 1775 to 1836.

Mrs. Prince.

Wife of Rev. John Prince.

Jonathan Tucker, Esq.

Merchant.

Mrs. Tucker.

Mr. Bowditch.

Rev. Dr. Lucius Bolles.

Baptist minister in Salem 1805; born 1779; died 1844.

Rev. Dr. T. Barnard, Jr.

(T. Barnard, Senr., was of the First church.) First minister North church, 1772 to 1814. Born 1748; died 1814.

Jonathan P. Saunders.

Surveyor and many years town clerk of Salem.

Rev. Dr. Bentley.

Minister East Church 1783 to 1819. Born 1759, died Dec. 29, 1819. Editor Essex Register. Harvard University 1777; tutor there. Distinguished as a theological and political writer. Much interested in antiquarian matters.

Rev. Mr. Fisher.

Rector of St. Peter's church; died in 1813.

Benjamin Pickman, Esq.

Born 1763; died 1843. Harvard University, 1784. Medical College, 1809-11. Merchant in Salem. Noted Federalist writer.

Mr. Joseph Peabody.

Distinguished merchant in Salem, from 1791 to 1844.

John G. King, Esq.

Lawyer and scholar, first President of Common Council.

Rev. Dr. Daniel Hopkins.

Minister South Church 1776. Born 1834; died 1814.

John Punchard, Esq.

Held various offices in Salem. Drummer at West Point, time of capture, of Maj. André, 1780.

PAINTINGS OF OLD HOUSES, ENGRAVINGS, PHOTOGRAPHS, BROADSIDES, ETC.

Narbonne House. Pastel, by Ross Turner. Essex Institute.

This house, built prior to 1680, still stands at 71 Essex Street and is a good illustration of the architecture of that period showing the lean-to roof.

Ward House. Pastel, by Ross Turner. Essex Institute.

This house built by John Ward about 1684 and still standing on St. Peter street shows the overhanging second story, which romance attributes to being used as a protection against the Indians. It is, however, an old country type of building brought over by the early settlers and was for the practical benefit of increased room in second story.

Cabot House. Water color, by Ross Turner. Essex Institute.

House built by Joseph Cabot about 1748 showing good example of gambrel roof.
▲ fine illustration of the colonial type.

Nichols House. Water color, by Ross Turner. Essex Institute.

Colonial house designed by McIntire, local architect.

Emmertton House. Pastel, by Ross Turner. Essex Institute.

House built 1817, and remodelled in 1886, shows good example of colonial spirit in modern architecture.

Roger Williams (Witch House). Water color, by Ross Turner. Essex Institute.

Owned in 1635-6 by Roger Williams. Familiarly called "Old Witch House," it being occupied in 1692 by Jonathan Corwin one of the judges in the witchcraft trials, and tradition has it that preliminary examinations of witnesses were held here. It is the oldest house in Salem or vicinity.

Derby Mansion. Heliotype. *Loaned by Mr. F. H. Lee.*

House built in 1799 by Elias Haskett Derby the eminent merchant. Present market house now stands on its site.

East Church. Lithograph. *Loaned by Mr. F. H. Lee.*

Building in which the famous Dr. William Bentley preached from 1783 to 1819.

East Church, interior. Lithograph. *Loaned by Mr. F. H. Lee.*

Pickman House. Lithograph. *Loaned by Mr. F. H. Lee.*

Built by Col. Benjamin Pickman, 1750. Still standing though defaced by shops in front. It is said that the term "Codfish Aristocracy" arose from the fact that the end of each stair in the hall of this house was ornamented with gilded codfish, Col. Pickman's fortune being derived from the fisheries.

Derby House, Washington St. Lithograph. *Loaned by Mr. F. H. Lee.*

House built in 1764. John P. Derby the humorist, and John Rogers, sculptor, both born in this house.

A corner in old Salem. Charcoal. *Loaned by the artist, Miss S. E. C. Oliver.*

View on Summer St. giving a characteristic bit of some of the old types of houses now fast disappearing.

Stairway in Cook House. Charcoal. *Loaned by the artist, Miss S. E. C. Oliver.*

House on Federal St. owned by Capt. Samuel Cook, a noted sea captain. The figure, winding the clock, is that of Henry K. Oliver the well known educator and writer.

An old Salem garden. Oil. *Loaned by the artist, Miss S. E. C. Oliver.*

Roger Williams House. Photograph from original sketch in possession of Essex Institute. See Witch House.

Bradstreet House. Photograph from original sketch in possession of Essex Institute.

House built by Emanuel Downing and occupied by Gov. Bradstreet. Stood on the site of the present Cadet Armory building.

Timothy Lindall tombstone. Photograph. *Loaned by Mr. John Robinson.*

Curious old tombstone erected to the memory of Timothy Lindall, a merchant in Salem. Can be seen in Charter St. cemetery.

Stage coach. Lithograph. *Loaned by Miss Laura E. Foye.*

Said to be first stage driven over Forest River road.

Battle of Bunker Hill. Engraving. *Loaned by Mr. F. H. Lee.*

Price Act.

Essex Institute.

List of prices put in force to prevent monopoly and oppression in the town of Ipswich at a meeting of the selectmen and committee of correspondence, Feb. 10, 1771.

Resolves of Provincial Congress.

Essex Institute.

Resolves of provincial congress, Watertown, June 16, 1775, against profanation of the Lord's Day.

Elephant handbill.

Loaned by Mr. John Robinson.

Ship America of Salem, Capt. Jacob Crowninshield, brought an elephant from Bengal to New York, Apr. 19, 1796. First elephant brought to this country. It sold for \$10,000 and was exhibited throughout the country, this show bill being used in Boston a year later.

Commission to Joseph Sprague.

Essex Institute.

Commission signed by the "major part of the council of Massachusetts Bay in New England" to Jos. Sprague, major in First Reg't Militia, Feb. 14, 1776.

John Little will.

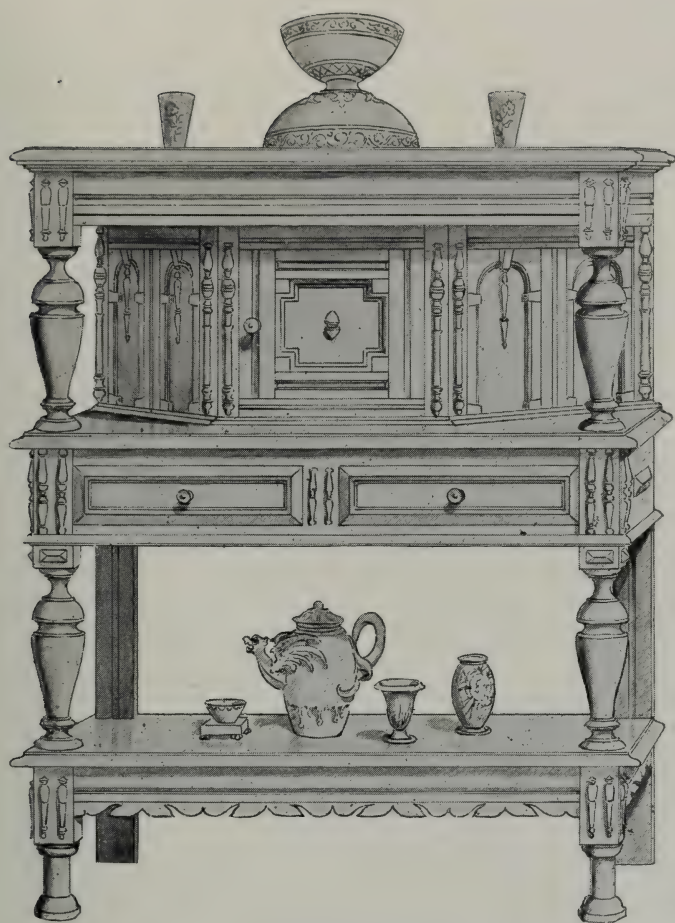
Loaned by Mrs. Grace A. Oliver.

Photographic reproduction of will made 1764, showing signatures, etc.

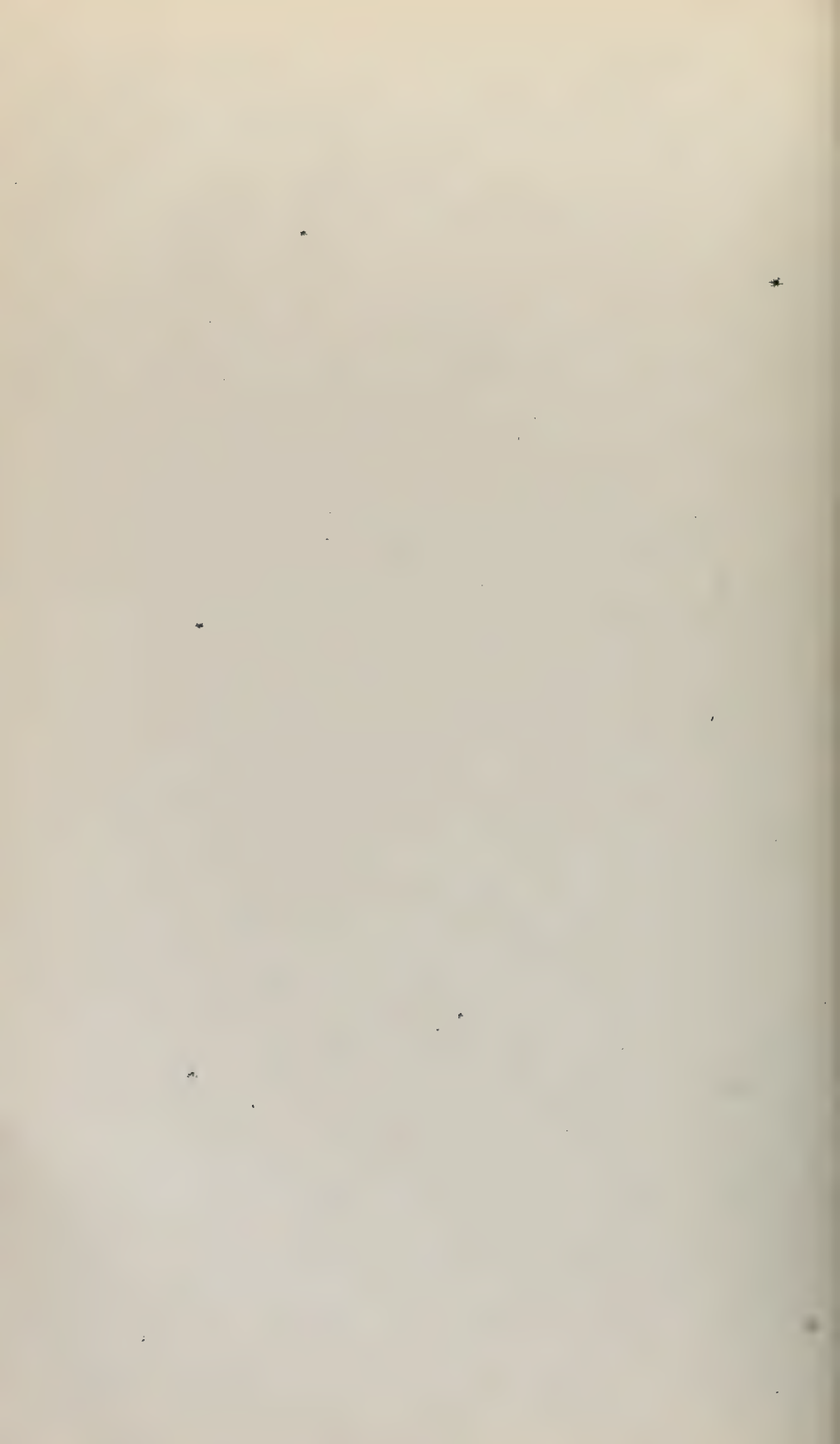
FURNITURE.

Court cupboard (Early Colonial period). *Loaned by Mr. Wm. C. Waters.*

Pictured in Lyon's Colonial Furniture Fig. 15. Doctor Lyon says Court Cup-



"COURT CUPBOARD."



boards were in use in England as early as 1586. In New England as well as the mother-country the Court Cupboard was found in the hall, the parlor or the chambers of the chief magistrates, the clergy, and other persons of wealth and social position. One is mentioned in the inventory of Wm. King, of Salem, 1654. There is here, as in England, a style of cupboard having its upper part enclosed. The part below was left open to receive the precious vessels of silver, glass and faience, which were also displayed from the cupboard's head.

Oak chest (Colonial period). Essex Institute. In use in Newburyport.

Doctor Lyon says the fashion of making chests with drawers underneath sprang up in England some time in the first half of the 17th century. They are more numerous in New England than those without drawers. The black applied ornamentation shows a later period than plain oak.

Secretary, mahogany (Pre-revolutionary period).

These Scrutoires, or Scrutoirs with bookcase, begin to be mentioned about 1710. One very much like the example shown is pictured by Lyon's Fig. 51, his bearing date 1737. The Institute example was in use in Salem for years. Note the finish of interior, secret drawers (so called), etc.

Sideboard, mahogany (Pre-revolutionary period).

Essex Institute.

This style of sideboard came in later than the buffets and are probably products of the Chippendale (1753) and Heppelwhite (1780) designs. This example comes from a Maine family and has been traced to Revolutionary times, it having been in the family of Gen'l Knox at the time of the Revolution.

Corner cupboard.

Essex Institute.

Corner Cupboards are mentioned in New England in 1719, and Doctor Lyon thinks they differed from the Beaufat or Buffet. These were built generally into the corner, but movable buffets of mahogany were made in Philadelphia. They were used for the display of glass and china.

Black oak chest (Early Settler period, about 1650-1680). *Loaned by Mr. Jos. Hudson, Newburyport.*

The carving on this chest besides the usual conventional design has for a central ornament the Judgment of Solomon.

Clock (black oak case). *Loaned by Mr. Jos. Hudson, Newburyport.*

Tall clock cases were probably not known much before 1680 (Dr. Lyon). This case is older than the works. The door carving represents Adam and Eve driven from the garden of Eden. The base, Moses in the bulrushes. The works are by Lister and Bromley, Halifax, England.

Oak table (Massachusetts Bay Colony period). *Loaned by Mr. W. J. Stickney.*

Tables of this description are mentioned in inventories in 1669. These were favorites in New England in the seventeenth century.

Small table (Witchcraft period).

The real use of this table is in some doubt. Doctor Lyon, the authority in colonial furniture, does not mention any of this kind. It has been in a family whose

ancestors were connected with the witchcraft delusion and the tradition is that it came down from that period. It has every appearance of being a genuine example and it was obtained through Mr. J. C. Casey, a well known dealer.

Table chair (about 1654). *Loaned by Mr. W. J. Stickney.*

These chairs were used for tables and when not in use were set at the side of the room. They are quite rare. Doctor Lyon, in Figs. 94 and 95, shows one very similar to this example.

Reading chair (Colonial period). *Loaned by Mr. W. J. Stickney.*

Two high-backed chairs (Witchcraft period). *Loaned by Mrs. Wm. C. Waters.*

These chairs came from the Rebecca Nurse house and tradition says date back to the Bishop family.

Settle (Revolutionary period). *Essex Institute.*

This settle comes from one of the old houses of Salem. It was originally in use in the living room but afterwards was removed to the porch.

Arm chair and four fan-backed chairs. *Loaned by Peabody Academy of Science.*

These chairs of the "Windsor" style belonged to the East India Marine Society and were used by the merchants and ship-masters at the banquets of the society about 1804.

Six painted chairs. *Essex Institute.*

These chairs about 1810 and later, were in use in the "best" rooms of Salem houses.

Two high-backed oak chairs (Renaissance). *Loaned by Mr. and Mrs. J. T. Moulton, Lynn.*

Two shield-backed mahogany chairs (Heppelwhite). *Loaned by Mr. W. J. Stickney.*

High-backed walnut chair (Early Colonial). *Loaned by Mr. W. J. Stickney.*

Two walnut chairs (Queen Anne). *Loaned by Mr. W. J. Stickney.*

Two maple chairs (Chippendale style). *Loaned by Mr. W. J. Stickney.*

Four Windsor chairs (about 1750). *Loaned by Mr. W. J. Stickney.*

Hall clock. *Loaned by Mr. John Robinson.*

Clock by "Nathaniel Mulliken, Lexington" in solid mahogany case. The works

were originally in a cherry wood case of older style and doubtless they were running in some mansion in the neighborhood of Concord or Lexington at the time the British regulars were marching through these towns on the eventful April 19, 1775. Nathaniel Mulliken made clocks from 1751 to 1767. His sons continued the business until the factory was burned by the British Troops on the night of April 19.

Andirons. Ball pattern. *Loaned by Mr. John Robinson.*

Andirons, and fire set. Oval pattern. *Loaned by Mr. W. J. Stickney.*

CHINA, GLASS, ETC.

Corner Cupboard.

Ridgway plate. Beauties of America. South Boston Insane Hospital. *Loaned by Mr. W. J. Stickney.*

Staffordshire plate, Clews. Peace and Plenty. *Loaned by Mr. W. J. Stickney.*

Staffordsh're plate. State House, Boston. *Loaned by Mr. W. J. Stickney.*

Rogers plate. State House, Boston. *Loaned by Mr. W. J. Stickney.*

Enoch Wood plate. Com. McDonough. *Loaned by Mr. W. J. Stickney.*

Ridgway pitcher. State House, Boston. *Loaned by Mr. W. J. Stickney.*

Nahant Hotel plate. *Loaned by Mr. W. J. Stickney.*

Harvey plate. English. *Loaned by Mr. W. J. Stickney.*

Platter, Old Italian Majolica. *Loaned by Mr. W. J. Stickney.*

Platter, Toft-ware. Staffordshire 1675, slip decoration. *Loaned by Mr. W. J. Stickney.*

English plate. Formerly belonged to Tobias Lear, Portsmouth, Washington's private secretary. *Loaned by Mr. W. J. Stickney.*

Nankin plate. *Loaned by Mr. W. J. Stickney.*

Nankin plate. " " "

Canton plate. " " "

Tuscan rose plate, English. *Loaned by Mr. W. J. Stickney.*

Cup and saucer, American ware. Delaware. *Loaned by Mr. W. J. Stickney.*

Delft plate. Loaned by Mr. W. J. Stickney.

“ “ “ “
“ “ “ “

Liverpool plate. Herculaneum. Loaned by Mr. W. J. Stickney.

English plate. Loaned by Mr. W. J. Stickney.

Jackson plate. Clyde. Loaned by Mr. W. J. Stickney.

Liverpool plate. Loaned by Mr. W. J. Stickney.

Old Delft plate. “ “ “

Cup and saucer. State House, Boston. Loaned by Mr. W. J. Stickney.

Old English pitcher, used by Miss Susannah Ingersoll at “House of Seven Gables.” Essex Institute.

Old China pottery teapot. “House of Seven Gables.” Essex Institute.

Staffordshire pepper pot, 1825. Essex Institute.

Pewter pot, pint. “

Ridgway pitcher. Tam O'Shanter 1832. Loaned by Mr. John Robinson.

Silver cream jug. Marriage pitcher of Susannah Ingersoll and Daniel Bray, 1680, descended through family of Philip English to Susannah Ingersoll occupant in Hawthorne's time of so-called House of Seven Gables. Mark D^B_s Loaned by Mr. John Robinson.

On Sideboards, Mantels, etc.

Teapot, blue decoration. Essex Institute.

Face mug. “ “

China punch bowl. “ “

Delft punch bowl. “ “

Teapot. “ “

Sugar bowl. “ “

Pitcher, snake pattern. “ “

Delft pitcher. “ “

Pitcher. Boar's head. “ “

Pitcher, Liverpool ware, ship ornamentation. Loaned by Mr. W. J. Stickney.

Two glass decanters, about 1800. Loaned by Mr. W. J. Stickney.

- Six brass candlesticks. Loaned by Mr. T. F. Hunt.
- Plate, English, blue printed ornamentation. Loaned by Mr. T. F. Hunt.
- Plate, English, gray printed ornamentation. Loaned by Mr. T. F. Hunt.
- Pitcher, Liverpool ware, Masonic emblems. Loaned by Mr. W. J. Stickney.
- Ginger jars. Old style. Loaned by Mr. T. F. Hunt.
- Mug. Bacchus. " " "
- Teapot, English ware, blue decoration. Loaned by Mr. T. F. Hunt.
- Two liquor jugs, decorated glass. Loaned by Mr. T. F. Hunt.
- Coffee pot, Old Canton ware. Loaned by Mr. T. F. Hunt.
- "Old blue" plates, Canton ware. Loaned by Mr. J. Robinson.
- Three grog tumblers. Loaned by Mr. W. J. Stickney.
- Soup tureen, "Old Blue" Canton ware. Loaned by Mr. J. Robinson.
- Vegetable dishes, "Old Blue" Canton ware. Loaned by Mr. J. Robinson.
- Coffee pot, "Lowestoft." Loaned by Mr. J. Robinson.
- Teapot, " " "
- Engraved grog tumbler. " "
- Engraved grog tumbler with handle. Loaned by Mr. J. Robinson.
- Grog tumbler, plain. Loaned by Mr. J. Robinson.
- Bowl, blue decoration. Loaned by Mr. J. Robinson.
- Bowl, Liverpool ware. " "
- Teapot, Liverpool ware. " "
- Sugar bowl, blue decoration. Loaned by Mr. J. Robinson.
- Two silver plated candelabras. In use at South church, Salem, 1804. Loaned by Mr. John Robinson.

Publications of the Essex Institute and books of local historical interest in Reception Room. These books are bound in leather made in Salem.

Visitor's Guide to Salem.

Historical Sketch of Salem. Osgood and Batchelder.

Old Naumkeag. Mr. W. S. Nevins.

Naumkeag Directory. Mr. H.M. Meek.
 Salem Witchcraft in Outline. Mrs. C. E. Upham.
 Witchcraft in Salem Village. Mr. W. S. Nevins.
 Our Trees. Mr. John Robinson.
 Salem Light Infantry. Mr. Geo. M. Whipple.
 Records of Town of Manchester.
 Records of Town of Gloucester.
 Morse's Japanese Pottery. Sylvester Baxter.
 Arrow Release. Mr. E. S. Morse.
 History of Marblehead. Mr. S. Roads, Jr.

Eight volumes consisting of gleanings from the Historical Collections and Bulletin of the Essex Institute.

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Reports of Field Meetings.
 Regular Meetings.
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Natural History, etc.

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 Glacial Phenomena. Wright.
 Geological Notes. Sears.
 Dispersion of Certain Mollusks. Morse.
 Mollusca of Iowa. Keyes.
 Reptiles from Texas and Mexico. Garman.
 Fishes of Essex County. Goode and Bean.
 New Sharks. Garman.
 A Species of Heptranchium. Garman.
 Contribution to Myology of Tachyglossum hystrix. Fewkes.
 Aid to Collectors of Cœlenterata in New England. Fewkes.
 Birds of Massachusetts. Allen.
 Birds of Colorado. Ridgway.
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 Pigeons. Barton.

Botany.

Botany in Essex County. Robinson.
 Notes on Flora of South Georgetown. Horner.

Victoria Regia. Russell.
Introduced Plants near wool-scouring establishment. Alcott.
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Folk Lore, etc.

Indian Games. Davis.
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Summer Ceremonial at Zuñi. Fewkes.
Andean Medal. Garman.
Conventionalism in Ancient American Art. Putnam.
Chipped Stone Implements. Putnam.
Ipswich Shell-heap. Robinson.
Indians of Los Angeles. Hoffman.

Biography.

Benj. Peirce. Rantoul.
Reminiscences of distinguished Essex County men. Crosby.
Choate, Cushing and Rantoul. Stone.
Samuel Parris. Fowler.
John Bertram. Atwood.
Tristram Dalton. Stone.
Governor Andrew. Stone.
Sir William Pepperrell. Dame.
Jones Very. Andrews.

Local History.

Common Fields. Adams.
Salem Commons. Adams.
“ Newspapers. Streeter.
“ Musical Societies. Whipple.
Early Recollections of Essex Street. Thayer.
Centennial Anniversary of Provincial Assembly. Goodell.
Leslie's Retreat. Endicott.
Twenty-fifth Anniversary Settlement of E. B. Willson.
Methodism in Salem. Almy.

Cruises.

Cleopatra's Barge. Crowninshield.

Early California Voyage. Eagleston.
Commission of a Salem Privateer. Crowell.
Sea Journal of Caleb Foote, Sr., compiled by Caleb Foote.
First Cruise of Frigate Essex. Preble.

Genealogy.

Genealogical Gleanings in England. Waters.
Henry Silsbee. Emmerton.
Richardson and Russell. Kimball.
Prince Family, Danvers. Putnam.
Allen Family, Manchester. Price.
Perkins Family. Perkins.
Records of First Church. Emmerton.
Salem Baptisms. Emmerton.

Nine albums of photographic views. These were selected from the series of Art Views of Historic Salem published by Mr. Frank Cousins, placed on special mounts and consist entirely of buildings, sites, architectural studies, etc., that can be seen by visitors in Salem to-day.

Salem Streets and Business Buildings.

Chestnut St. west from Summer.
Boston St. and "Big Tree."
Essex St. west from Essex Institute.
Old Bakery, High St., built about 1700.
Foot of Creek St.
Washington St. west side, and Railroad Station.
Essex St. east from Washington.
Essex St. west from Museum.
Essex St. near St. Peter St., site of William Gray's garden.
North St. north from Bridge St.
William Gray's Counting-room.
Joseph Peabody's Counting-room.
Forest River Lead Mills, 1832.
Naumkeag Steam Cotton Mills.
Salem Electric Lighting Co., 1890:
Frisbee's Boat Yard, off Derby St.

Derby Wharf (built about 1760), 1890.
 Phillips Wharf and Wilkesbarre Coal Elevators.
 Essex House, William Gray's residence in 1800.
 Bank Building, Central St., about 1816.
 Asiatic Building, Washington St., 1854.
 Northey Building, Washington and Essex Sts., 1873.
 Odell Building, Washington St., 1891.
 Peabody Building, Washington St., 1892.
 Gardner Building, Essex St., 1892.

Salem: Public Buildings.

Custom House, Derby St., 1818 ; also Old Ladies' Home, 1816.
 Post Office, Washington St., 1882.
 Court Houses, Federal St., 1840 and 1892.
 Court House (1892), Law Library, east.
 " " " " " west.
 Salem Jail, St. Peter St., 1813 and 1884.
 Hamilton Hall, Chestnut and Cambridge Sts., 1805.
 Mechanic Hall, Essex St., 1832.
 Boston and Maine Railroad Station, 1845.
 Armory, Salem Cadets, Essex St. (Francis Peabody Residence
 1818).
 Armory, Salem Cadets Essex St. Officers' quarters.
 " " " " " Drawing-room.
 " " " " " Mantel in drawing-room.
 " " " " " Doorway " " "
 " " " " " " " reception "
 " " " " " Mantel in banquet hall.
 " " " " " Banquet hall, north.

Town Hall and Market, 1816.
 City Hall, Washington St., 1838.
 " " Indian Deed of Salem, 1686.
 Steamer House of Fire Department, Church St.
 Alms House 1816 and Insane Asylum 1884, Salem Neck.
 Plummer Farm School, Winter Island.
 Franklin Building, Washington Square, 1860.
 Salem Hospital, Charter St. (Bryant House 1815).
 Old Men's Home, Derby St. (Waters' residence 1815).

Children's Friend Society, Home on Carpenter St., 1878.
 Woman's Friend Society, Elm St. (Residence about 1804).
 City Orphan Asylum, Lafayette St. (Roman Catholic).

Salem: Old Houses.

Pickering House, Broad street, 1651.
 Narbonne House, Essex street, 1680 (west).
 " " " " 1680 (east).
 " " " " 1680 (rear).
 John Ward House, St. Peter street, 1684.
 Old Bakery, Washington street, 1680.
 Cromwell House, rear of Derby street, about 1680.
 An old "cent shop," Essex street, about 1780.
 Barton House and studio, Washington square, about 1740.
 Old Derby Mansion, Derby street, 1762.
 Residence, Hon. W. C. Endicott (Cabot House), Essex street,
 1748.
 Miles Ward House, Herbert street, about 1760.
 Fitch-Derby mansion, Lafayette street, about 1780.
 Derby Mansion, Washington street, 1764.
 Hodges House, Essex street, 1780.
 Old Assembly Hall, 1769. Now residence of Mrs. John
 Bertram. Lafayette entertained here Oct. 29, 1784, and
 Washington Oct. 29, 1789.
 Nichols House, Federal street, about 1798 (front).
 " " " " 1798 (rear and court yard).
 "The Studio," Chestnut and Summer street, 1826, showing spire
 of South church, 1805.
 Peabody and Lord residences, Washington square, about 1818.
 Residence of Mrs. Geo. R. Emmerton, Essex street. Restored
 colonial architecture.
 Andrew House, Washington square, 1818.

Public Grounds, Walks, etc.

The Common, western gate.
 The Willows and Juniper Point.
 " " (planted 1802), Salem Neck.
 Wharf at Willows.

Baker's Island (Salem Harbor), Government Lights.

“ “ The Cliffs.

“ “ Point of Rocks.

Charter street cemetery, Old Burying Point, 1635, entrance.

“ “ “ Oldest headstone, 1673.

“ “ “ Old headstone, 1688.

“ “ “ Mary Corey headstone, 1684.

“ “ “ Timothy Lindall headstone, 1698.

“ “ “ Old headstones.

Broad street cemetery, Gen. Fred Lander's tomb.

“ “ “ Sewall children headstone.

“ “ “ Timothy Pickering tomb.

Harmony Grove “ near entrance.

“ “ “ Jesse Smith monument.

“ “ “ John Bertram “

“ “ “ Geo. Peabody “

Greenlawn “ The Lake.

Floating Bridge, 1802, on turnpike to Boston.

Endicott pear tree, planted 1630, Danvers.

Francis Peabody Mansion, built prior to 1770 by Robt. Hooper,
Danvers.

Whittier's Danvers Home, built by W. A. Lander, 1842.

Geo. Jacobs House, 1690, Danvers. Jacobs taken from this
house and tried for witchcraft, 1692.

Rebecca Nurse monument, Danvers.

Old Powder House, 1775, Marblehead.

Lee Mansion, 1768, Marblehead.

Stairway in Lee Mansion, 1768, Marblehead.

Door in Story House, about 1743, Marblehead.

Salem: Historical Sites and Portraits.

Roger Williams House, 1634. Residence of Judge Corwin,
1692; also known as the "Witch House."

The same, showing older portion only.

Shattuck House, Essex street. Bridget Bishop accused of be-
witching a child here.

Residence of A. C. Goodell, Jr., Esq. Site of and contains
timbers of Witchcraft Jail of 1692.

- Gallows Hill. Site of witchcraft executions in 1692.
- North Bridge. Site of "Leslie's Retreat," Feb. 26, 1775.
- Joshua Ward House. Gen. Washington passed the night here Oct. 29, 1789.
- Birthplace of Nathaniel Bowditch, Mar. 26, 1773, and of Rev. Samuel Johnson, Oct. 10, 1822. House removed from Brown street.
- Residence of Rev. Dr. William Bentley and place of his death, 1819, Essex street.
- Residence of Judge Joseph Story, 1811—. Birthplace of W. W. Story, 1819. Visited by Lafayette, 1824.
- Doorway of Custom House, 1805, Central street.
- Essex Bridge, 1788. Inspected by Washington, 1789. Site of Winthrop's landing, 1630, in foreground. Beverly at distance.
- Allen pear tree, Hardy street. Planted in 1640.
- Nathaniel Hawthorne, 1804-64. From Mayall daguerreotype.
- Hawthorne's birthplace, July 4, 1804, Union street. "Built about 1680."
- Rear of Hawthorne's Herbert street residence from birthplace on Union street. "My old accustomed chamber" is in this house.
- Dr. Nathaniel Peabody's residence, 1838. "Dr. Grimshawe's House," "cornered on a graveyard." Charter street.
- Porch of Dr. Peabody's residence, 1838. "Affording a glimpse up and down the street through an oval window on each side." Charter street.
- Hawthorne's Chestnut St. residence, 1846. "The birds do visit our trees in Chestnut St."—Mrs. Hawthorne's letter.
- Hawthorne's Mall street residence. "The Scarlet Letter" was written here in 1849.
- Ingersoll House, about 1670, often called "House of the Seven Gables." Turner street.
- Gov. John Endicott, 1588-1665. From portrait in Essex Institute, Salem.
- Gov. Simon Bradstreet, 1603-1697. From portrait in Essex Institute. Original in Mass. State House.
- William Pyncheon. "An dom 1657," "ætat. 67." Portrait at Essex Institute.

Mrs. Deborah Clarke, grandmother of Lord Bryan Fairfax.
Portrait at Essex Institute.

Mrs. Annie (Brown) Fitch. From picture by Copley at Essex
Institute.

Alexander Hamilton, 1757-1804. From picture by John Trum-
bull at Essex Institute.

Judge Joseph Story, 1779-1845. From portrait by Charles
Osgood at Essex Institute.

Leverett Saltonstall, 1783-1843. From portrait by Charles Os-
good at Essex Institute. First Mayor of Salem.

Nathaniel Bowditch, 1773-1838. From portrait by Charles
Osgood at Peabody Academy of Science. Mathematician.

Elias Haskett Derby, 1739-1799. From portrait by James
Frothingham in Peabody Academy of Science.

Jacob Crowninshield, 1770-1808. From painting by Robert
Hinkley in Peabody Academy of Science.

William Gray, 1750-1825. From painting after Gilbert Stuart
at Peabody Academy of Science.

Joseph Peabody, 1757-1844. From painting by Charles Os-
good at Peabody Academy of Science.

Nathaniel Silsbee, 1773-1850, U. S. Senator. From painting
by A. Hartwell after Chester Harding at Peabody Academy
of Science.

Capt. John Bertram, 1796-1882. From painting by Edgar
Parker at Peabody Academy of Science.

George Peabody, 1795-1869. From painting at Peabody Insti-
tute, Peabody, Mass.

George Peabody, 1795-1869. From marble bust at Peabody
Institute, Peabody, Mass.

Salem Schools and Churches.

State Normal school, Broad and Summer streets.

High school, Broad street. 1856.

Oliver (Primary) school, formerly old Latin school, Broad street.

Bentley (girls grammar and primary) school, Essex street. 1861.

Bertram (Primary) school, Willow avenue.

First church (Unitarian) corner Essex and Washington streets.
1826, remodelled 1874.

- East church (Unitarian), Washington square. 1846.
 Tabernacle church (Orthodox Congregational), Washington street. 1854.
 North church (Unitarian), Essex street. 1835.
 " " " " " interior.
 South church (Orthodox Congregational), Chestnut street, spire by McIntire.
 Independent church (Unitarian), Essex street. 1824.
 Friends' Meeting House, Pine and Warren streets. 1832.
 St. Peter's church (Episcopal), St. Peter street. 1833.
 Grace church (Episcopal), Essex street. 1858, remodelled 1889.
 First Baptist church, Federal street. 1806, remodelled 1868 and 1878.
 Central Baptist church, St. Peter street. 1826. Remodelled 1877.
 Advent Christian church, North street. 1890.
 Universalist church, Rust street. 1808. Remodelled 1888.
 Immaculate Conception (Roman Catholic) church, Walnut street. 1857. Remodelled 1880.
 Immaculate Conception (Roman Catholic) church, interior.
 St. Joseph's (French Roman Catholic) church, Lafayette street. 1883.
 Lafayette Street (Methodist) church, Lafayette and Harbor streets. 1853.
 Wesley (Methodist) church, North street. 1888.
 New Jerusalem church (Swedenborgian), Essex street. 1871.
 Marine Society's Bethel (non-sectarian), Turner street. 1890.

Salem Literary and Scientific Societies.

- Salem Public Library (Bertram Mansion) Essex street.
 " " " Entrance.
 " " " Delivery desk.
 " " " Delivery room.
 " " " Reading room.
 " " " Reference room.

Peabody Academy of Science (East India Marine Hall 1824), Essex street.

Peabody Academy of Science (East India Marine Hall 1824),
rear view, Essex street.

Peabody Academy of Science	Zoölogical collections.	Birds.
"	"	"
"	"	Corals.
"	"	"
"	Essex Co.	Turtles.
"	"	"
"	"	Minerals.
"	"	"
"	Marine trophy :	East Hall.
"	South gallery :	"
"	North	"
"	"	"
"	Relics East India Marine Society.	

Essex Institute (Daland Mansion) Essex street.

"	"	Entrance.
"	"	Reception room.
"	"	Historical room (portrait Dr. Henry Wheatland).
"	"	Antiquities, historical room.
"	"	Old China,
"	"	"
"	"	First Puritan Meeting House. 1634.

Essex Institute. Interior First Puritan Meeting Home showing
Hawthorne, Bowditch and Gray desks.

Essex Institute. "Ship Rock" near Salem, the property of the
Institute. Weight 1100 tons.

Plummer Hall, Essex street.

" " interior, Salem Athenæum.

Salem: Halls, Stairways and Mantels.

Narbonne House, Essex street, interior, corner-cupboard, 1680.

" " " " star shutters, 1680.

Hubon " Charter street, stairway, 1780.

Hodges " Essex street, stairway, 1780.

" " " newel post, 1780.

Lindall " " stairway, 1740.

Brown " Summer street, stairway, about 1780.

" " " " turn, about 1780.

Nichols " Federal street, interior, 1798.

" " " " 1798.

" " " stairway, 1798.

" " " stair landing window, 1798.

Washington Hall, Washington street, fireplace, 1792.

- Lindall House, Essex street, mantel 1740.
 Fitch-Derby Mansion, Lafayette street, mantel, about 1780.
 Old Ladies' Home, Derby street, mantel, 1816.
 " " " " 1816.
 Kimball House, Pickman street, mantel, about 1804.
 " " " " " "
 Clifford Crowninshield House, Washington square, mantel
 McIntire, 1805.
 Woman's Friend Society, Elm street, mantel, 1804.
 " " " " " " 1804.

Salem: Doorways.

- Robert Stone House, Walnut street, about 1700.
 Twenty-three Summer street, about 1780.
 Miles Ward House, Herbert street, about 1760.
 Fifty-two Essex street, about 1790.
 Z. Silsbee House, Washington square, about 1800.
 Stearns House, Essex street, Flint street door, about 1800.
 Eighty-one Essex street, about 1800.
 Nineteen Margin street, about 1760.
 Osgood House, Essex street, about 1765.
 Cabot-Endicott House, Essex street (1748). Doorway re-
 stored, 1875.
 Ives-Court House (Pine apple), about 1750.
 Six Downing street, about 1750.
 Nine Federal street, about 1804.
 Browne House, Summer street (about 1780). Doorway about
 1804.
 Eighty-five Essex street, about 1800.
 Home for aged men, Derby street, Turner street doorway
 about 1815.
 Lord House, Washington square, Oliver street doorway, 1817.
 Derby street about 1799: "Decayed gentility."
 Stearns House, Essex street, about 1800.
 Nichols House, Federal street, 1798.
 Ropes House, Essex street, about 1750. Doorway, 1835.
 Cook House, Federal street, about 1802. Fence posts from
 Elias Haskett Derby Mansion, Essex street, 1799.

Kimball House, Pickman street, about 1804.

Nathan Robinson House, Chestnut street, 1804. Remodelled by Mr. Little, 1887.

Francis Peabody House (Cadet Armory), Essex street, about 1818.

Forrester House (Geo. Peabody), Washington square, 1819.

Pickman House (Benj. Shreve), Chestnut street, 1816.

Pickering Dodge House (Dr. Shreve), Chestnut street, 1817.

Emmerton House, Essex street (Pickman house, 1817), remodeled, 1886.

Emmerton House, Essex street, Western end and yard, 1886.

John C. Lee House, Chestnut street, 1848.

Clifford Crowninshield House, Washington square, 1805.

White House (D. Pingree), Essex street, about 1817.

Tucker House, Essex street, about 1818.

Andrew House (W. O. Safford), Washington square, 1819. doorway altered about 1860.

Whipple House, Andover street, restored colonial.

HISTORICAL RELICS IN THE TABLE CASES.

Case 1. The coins and paper currency of Massachusetts Bay in New England during the Colonial and Revolutionary periods covering issues from 1650–1788. A tablet in the centre of this case contains the coins all of which are in fine condition, as follows :—

New England Shilling: Obv. "N. E.," rev. "XII." Minted at Boston in 1650, and considered the earliest as well as one of the rarest of the coins of the American colonies. *Loaned by Mr. F. H. Lee.*

Six Pine Tree Shillings, 1652.

Three Oak Tree Shillings, 1652.

Two Pine Tree Six-pences, 1652.

Three Pine Tree Three-pences, 1652.

Three Oak Tree Two-pences, 1662.

Four Massachusetts or "Indian" cents, 1787 and 1788.

Four half-cents as above.

Loaned by Messrs. H. M. Brooks and F. H. Lee.

The "Pine Tree" silver is the most interesting as well as the best known of the Colonial money. It was minted from 1652 to 1680 but always bore the date 1652, it is said, to prevent the authorities in England from checking this assumed right of coining money in Massachusetts. The twopenny pieces, however, bear date 1662. John Hull, the mint-master, lived at the present Pemberton Sq., Boston, his house later being occupied by Judge Samuel Sewell who received a dowry with his wife, Hull's daughter, of her weight in Pine Tree shillings; but this dowry has been placed by some writers at £30,000, rather a heavy weight, however, for even the stout daughter. Many of the dies for these coins were cut by Joseph Jenks, then connected with the Iron works at Saugus, the earliest to cast iron ware in the country. Immense quantities of the Pine Tree coins were minted but all varieties are now rare.

The dies for the copper cents and half cents of 1787-8 were made by Joseph Callender, whose place of business was at "Half square State St.," Boston, or where Brazier's Building now stands, and later by Jacob Perkins of Newburyport. Joshua Witherle was the mint-master, popularly known as "the cent maker," and lived and had his mint on the land now numbered 1132-44 Washington St., at E. Waltham St., Boston. The building was of wood 20 by 40 feet. (See exhaustive account of the Massachusetts coins in Crosby's *Early Coins of America*.)

The paper currency illustrates the issues from 1690 to the merging of the state in the nation, and includes many very rare and interesting specimens of these old bills. Among these are the "Pine Tree" and the "Sword in hand" issues. In addition to the currency are two State notes.

The collection in detail is as follows:—

1690, bill of 5 shillings.

1713-1740, bill of 1 shilling.

1744, bill of 2 pence.

1740, "A Crown."

1737, 1, 3, and 5 pence.

1776, June 18, 1 and 4 shillings.

1776-1778 (Pine Tree bills), 3 pence, 8 pence, 1 shilling, 1 and 6 pence, 2, 3, 4, 5 shillings, 4 and 8 pence, 5 and 4 pence.

1776-1778 (Pine Tree), bills of 2 and 6 pence and 3 shillings uncut, as printed together on one sheet.

1775-1776 (Sword-in-hand bills), 1 and 4 pence, 8, 12, and 48 shillings.

1776, an old counterfeit bill of 4 dollars.

1780, Massachusetts Bay, Continental Currency series with set to show backs 1, 2, 3, 4, 5, 6, 7, 8 and 20 dollars.

A bundle \$2,000, of cancelled \$20 bills preserved in the original package.

Treasury note 44 pounds 3 shillings Dec. 1, 1777, to Josiah Hemmenway.

War Committee note for 10 pounds March 11, 1777.

Case 2. Early new England press-work, broadsides, almanacs, etc., selected from the collections of the Essex Institute.

Eighteenth-century almanacs including interleaved almanac with manuscript notes of family and local happenings, an old colonial custom.

Engraving, by Paul Revere, and in original frame, of the Boston Massacre, March 5, 1770.

Broadside: ballad on the death of General Wolfe, Sept. 13, 1759.

Pamphlet: abstract of Massachusetts criminal laws, printed in 1704, containing the famous "Scarlet Letter" law.

Pamphlet: relating to the Maule controversy; "Persecutors mauled with their own weapons."

Salem and Boston eighteenth-century newspapers: Essex Register, N. E. Courant, Sentinel, Gazette, Post Boy, including one in mourning announcing the death of George Washington.

Lottery tickets, loaned by Mr. Henry M. Brooks: United States lottery to recoup war expenses 1776; State of Massachusetts to procure funds 1781; Harvard College for educational purposes 1795; a church at Bristol, R. I., for church funds, 1802.

Case 3. Old-time needlework.

Sampler wrought by Mary M. Peele, 1778.

Basket of flowers, Kensington stitch, about 1790.

Sampler wrought by Ruth Gray, 1804.

Sampler wrought previous to 1628 by Anne Gower, the first wife of Gov. John Endicott.

Sampler wrought by Martha C. Fitzhugh, of Virginia, 1793.

Pocket-book wrought by Eliza Willard, 1760.

Pocket-book wrought in 1765.

Sampler wrought by Sarah Courtis, 1770.

Case 4. Art in the home in old times in New England.

Colored engraving of Nelson's victory 1798.

Painting on glass: girl before a monument and weeping-willow.

Needlework and water-color combination picture. *Loaned by Mrs. H. M. Brooks.*

Colored engraving: "The Royal Ann."

Pastel: head of a girl, by William Blythe, Salem, early present century.

Case 5. Manuscripts: early theological; witchcraft.

Sermon preached by Rev. Mr. Pickman, 1644.

Sermon preached by Rev. Mr. Diman of the East church, Salem, in 1756.

Sermons preached by Rev. Mr. Sewall, 1727-1744.

Sermon preached by Rev. George Curwen at First church Salem, Aug. 23, 1716, for successes of Geo. I over the Pretender.

Volume of sermons preached by Rev. Mr. Henry Gibbs, 1695.

Deposition of Mrs. Ann Putnam and Ann Putnam Jr., before magistrates Hathorne and Corwin, May 31, 1692, against Rebekah Nurse and others who were hanged for witchcraft in 1692.

Indictment of Abigail Hobbs of Topsfield for "covenanting with the devil," 1692.

Deed of Land signed by Bridget Bishop 1679, acknowledged before William Hathorne (ancestor of Nathaniel) and John Hathorne one of the witchcraft judges. She was executed for witchcraft in 1692—the first victim. Her residence was near the present corner of Church and Washington streets, Salem: the house in which "the puppets" were said to have been found.

Case 6. Manuscripts: early commercial.

Philip English's account book 1678-1690, with a photograph of his house from an old drawing.

Autograph letter of instructions by Elias Haskett Derby, 1779.

Parchment deed: Charles Downing to Thorndike Proctor, 1700.

Autograph of Retire Becket, one of Salem's noted ship builders.

Bill of Lading, schooner "Volant" Nov. 30, 1749, Timo. Orne, Jr.; shipping articles 1749, schooner "Hampton."

Autograph, Judge Benj. Lynde, 1751.

Bill of exchange, Elias Haskett Derby, 1784.

Underwriters' policy of insurance £1000, schooner "Volant," 1748.

Autograph, Wm. Gray Jr. (bill for tea), 1788.

Tax bill, Jos. Sprague (£80.10.6), 1781.

Case 7. Manuscripts: official.

Autograph letter of Benjamin Goodhue, New York, Feb. 7, 1790.
The first member of Congress from the Essex District.

Commission of Joseph Hiller, first U. S. Customs Collector, signed by George Washington, Aug. 4, 1789.

Resolution of the Continental Congress at Philadelphia directing General Washington to raise troops in New Hampshire, signed by John Hancock, President, and Charles Thompson, Secretary.

Autographs of Nathan Dane and Rufus Putnam on an order of Capt. Joshua Ward for "a whale boat," Salem, June 8, 1785.

Botanical note book of Manasseh Cutler (VIII 1787-1798);
"Descriptions of American Indigenous Plants, signed by him in 1787.

These last three autographs of Dane, Putnam and Cutler are memorials of the settlement of Ohio and the "freedom of the north-west territories."

License of Brigantine "Cicero" signed by Joseph Hiller, the first United States Customs Collector under Washington.

Instructions in regard to the British "Orders in Council" signed by James Munroe, Secretary of State, Aug. 28, 1812.

Case 8. Silhouettes, medals, seals, etc.

Silhouettes. Joseph S. Cabot, Salem merchant, horticulturist;

John Clarke Lee, Salem merchant, banker ; Joseph Peabody, Salem merchant ; Daniel Dutch, deputy sheriff ; all full length, contributed by Mr. F. H. Lee. Capt. Samuel Cook, silhouette, *loaned by Miss S. E. C. Oliver.*

Lithographs. Nathan Reed, inventor, member of Congress ; Gen. James Miller, "the hero of Lundy's Lane" and originator of the famous term "I'll try, Sir ;" William Oakes (1799-1848) of Ipswich, eminent botanist.

Silhouette. Leverett Saltonstall, first Mayor of Salem. *Loaned by Mr. F. H. Lee.*

Composition bas-relief, head of Alexander Hamilton.

French engraving, head of Timothy Pickering.

In the centre of this case on a tablet are the following coins, medals and seals :

Medal, Benjamin Franklin, Deplesus, Paris 1787. *Loaned by Mr. F. H. Lee.*

Bronze medal, Daniel Webster.

Copper medal, William Pitt.

Copper medal, George Whitefield, the preacher.

Bronze medal, Washington before Boston. *Loaned by Mr. John Robinson.*

Bronze medal, American Liberty 1776. *Loaned by Mr. John Robinson.*

Small medals : Washington, General American Armies, 1789 ; Washington, President, 1792 ; Washington, success to the United States ; Washington, "he is in glory, the world in tears." *Loaned by Mr. F. H. Lee.*

Collection of gold mounted seals, Cabot family of Salem, engraved stone seals, etc. *Loaned by Mr. F. H. Lee.*

Engraved stone seals : head of Pitt, head of Nelson. *Loaned by Mr. John Robinson.*

Case 9. Old-time objects of household use.

Tinder box with flint, steel and tinder.

Tinder box in the form of a "flint-lock."

Door-latch about 1800.

Bolt from a pew door, East Church 1718.

Spoon mould and pewter spoon.

Pewter porringer and pewter pepper-pot.

Two pewter platters.

Tongs used in taking coals from wood fires for lighting pipes.

Steelyards used in 1738.

Gold-dust scales used by merchants early in present century.

Pitch-pipe used for "setting the tune" in church choirs and in singing schools.

Pottery dish with partition through the centre pierced with a hole, made in Danvers, Mass., about 1780, used for "Indian pudding and baked beans."

Silver plated snuffers and tray, Hodges family, Salem, about 1798.

Loaned by Mr. John Robinson.

Small iron shovel with long handle formerly belonging to and used by Benjamin Franklin. Used for taking coals from wood fires for lighting pipes. This was given the present owner by a member of a family with whom Franklin lived in Boston. *Loaned by Mr. A. R. Stone.*

Spanish coins current in New England during the early part of the present century for 20, 25, 12½ and 6¼ cents respectively, and known locally as pistareen, Spanish quarter, nine pence (pronounced "nimepunce") and four-pence-half-penny (pronounced "fo-pun-sapeny"). *Loaned by Mr. H. M. Brooks.*

Case 10. Old-time objects of adornment and personal use.

Dutch tobacco box, 1482.

Old tobacco box.

Snuff boxes, seven in number, ornamented with designs in color.

Loaned by Mr. F. H. Lee.

Snuff boxes, the tailor; engraved figures, Charles X. *Loaned by Mr. W. J. Stickney.*

Snuff boxes: "wood and copper of the 'Royal George' sunk 1789, raised 1839" and "united we stand, divided we fall" Revolutionary period, belonging to Rev. Eliab Stone, of North Reading. *Loaned by Mr. John Robinson.*

Spectacles, eye-glasses, paste shoe buckles and two pairs of knee buckles, early present century.

Lady's pocket-book with figure. *Loaned by Mr. F. H. Lee.*

Pocket-book, leather, "Cape Breton 1745."

Patch box: to contain the little court plaster squares used by ladies in the old times.

A paper of pins: Revolutionary period.

Pounce box containing "pounce" used to give a surface where erasures were made on paper in the quill-pen period.

Buttons, 1692 and 1798. *Loaned by Mr. H. M. Brooks.*

Washington buttons. *Loaned by Mr. F. H. Lee.*

Large tortoise shell combs.

Pair of pattens, the forerunner of rubber shoes.

Pair of old "Para gum shoes," the first lined rubber shoes used.

Lady's shoes about 1800.

SALEM EXHIBITS.

Desiring that this pamphlet should contain a list of all the exhibits from Salem and their location at the Fair, in order to render it more valuable for use and reference, the committee advertised in the daily papers for a description of such exhibits, responses to which appear below. It is understood, however, that a number of Salem manufacturers whose names do not appear here, are represented at the Exposition, and also that the parochial schools have fine exhibits. Their location can without doubt be easily found in the official catalogue.

. SALEM PUBLIC LIBRARY.

Location :—U. S. Government building, Bureau of Education.

*Exhibit :—*Building and methods of a public library in a city of 30,000 inhabitants, located in a building altered from a dwelling house.

*Specifications :—*Six oak frames, about 24 x 30 in., containing three water-color sketches of building, one exterior, two interior, also plans of present building with proposed enlargement.

Six volumes bound in full crushed levant, being an album of photographs of building and furniture, scrap-book of blanks and cards, and the regular publications of the library ; also samples of regular styles of binding, etc.

THOUGHT AND WORK CLUB, SALEM, MRS. KATE TANNATT
WOODS, PRESIDENT.

Location: Woman's Building. Department of Federated Clubs of America.

New book of Proverbs, selected and original by members of Salem Thought and Work Club.

JAMES F. ALMY.

Window ventilator for ensuring current of pure air without draughts. To be seen in operation at Office of Prof. F. W. Putnam, Department of Ethnology.

SALEM PRESS PUBLISHING AND PRINTING COMPANY.

Location: Gallery Liberal Arts Building.

Examples of binding and press work, genealogical tables, genealogical and other publications. See Essex Institute and Salem Public Schools Exhibits for specimens of binding.

EXHIBITS OF SALEM PUBLIC SCHOOLS.

Location: Manufactures and Liberal Arts Building, Gallery, Massachusetts Schools Section.

1. An exhibit of work done by the boys in the Curwen Industrial School, during the last school year.
2. Twenty-one bound volumes of scholars' work taken from their annual examination papers of June 1892 and comprising work in all the grades of the several grammar schools, and all classes in the High school.
3. Ten bound volumes containing written papers from all the grades of all the grammar schools, showing one *illustrative lesson* designed to exhibit methods of teaching in geography, language and arithmetic.

4. *The Salem Historical Album.* This album is wholly the work of the pupils in the High school. It contains photographs of historic buildings, sites, streets, historical tablets, and other matters of interest, illustrating the history of Salem. All of these photographs were taken by pupils in the High school, and finished completely by them. The pictures are accompanied by descriptive text, which altogether give a graphic history of Salem from 1626 to the present time. These descriptions were written entirely by the pupils and by them have been copied upon the typewriter, the whole being bound (in leather, made in Salem) in one large quarto volume by the Salem Press Publishing and Printing Company.

5. A set of twenty photographs, representing the school-houses of this city. These photographs exhibit not only the exteriors of the school buildings, but interior views, showing various rooms during the school session, with the pupils at their regular class work.

6. A set of large photographs exhibiting the art embellishments of school rooms at the Phillips school. These pictures have been taken under the direction of Mr. Ross Turner, and show clearly the character of this new art movement, and the real appearance of the rooms as thus decorated.

7. Catalogue High school library.

KEPPEL COLLECTION OF ENGRAVINGS AND ETCHINGS.

Location : Woman's Building.

Etchings by Miss H. Frances Osborne.

Chestnut street, Salem, Mass.

Solitude.

View from Derby wharf, Salem.

EBEN PUTNAM, PUBLISHER AND PRINTER, SALEM.

Location : Department Liberal Arts ; with Essex Institute and Salem Press Publishing and Printing Company exhibit.

Putnam's Monthly Historical Magazine.

Visitor's Guide to Salem.

History of the Putnam Family in England and America.

Ancestral Charts. Genealogical and Historical works.

PARKER BROTHERS, PUBLISHERS, SALEM.

Location : Manufactures and Liberal Arts Building,
Northeast portion of Galley, Group 110, Class 693, Dept.
519.

Games for children and adults.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 25. SALEM: JULY, AUG., SEPT., 1893. Nos. 7, 8, 9.

ANNUAL MEETING, MAY 15, 1893.

THE annual meeting was held in Plummer Hall, this evening, at 7.30 o'clock, Vice-President A. C. Goodell, jr., in the chair. The record of the last annual meeting was read by the Secretary.

The reports of the Secretary, Treasurer, Auditor and Librarian were read, accepted and ordered to be placed on file.

The report of the committee on nominations was presented by Mr. C. S. Osgood, and it was

Voted, to proceed to the election of officers for the ensuing year. Messrs. Edes, Welch and Theodore Brown were appointed by the chair to distribute, collect, assort

and count votes. This committee reported the following list of names as receiving all the ballots, and these officers were declared unanimously elected :

PRESIDENT:

EDMUND B. WILLSON.¹

VICE-PRESIDENTS:

ABNER C. GOODELL, JR.,

DANIEL B. HAGAR,

FREDERIC W. PUTNAM,

ROBERT S. RANTOUL.

SECRETARY:

HENRY M. BROOKS.

TREASURER:

WILLIAM O. CHAPMAN.

AUDITOR:

GEORGE D. PHIPPEN.

LIBRARIAN:

CHARLES S. OSGOOD.

COUNCIL.

WILLIAM H. GOVE,

EDWARD S. MORSE,

THOMAS F. HUNT,

DAVID PINGREE,

DAVID M. LITTLE,

EDMUND B. WILLSON,

FRANCIS H. LEE,

GEORGE M. WHIPPLE,

RICHARD C. MANNING,

ALDEN P. WHITE.

REPORT OF THE SECRETARY.

Since the last annual meeting there have been twenty-one meetings of the society and three meetings of the directors, besides fourteen meetings of committees.

Only one field meeting was held the past year; this was at North Beverly near Wenham Lake, on September 21. A number of persons who took the forenoon train were entertained at the house of Mr. W. S. Nevins.

¹ Mr. S. Endicott Peabody was first elected but declining to serve, Rev. E. B. Willson was chosen at a regular meeting, June 19, 1893.

Most of the party went on the 1.25 train from Salem. The meeting in the afternoon was in the vestry of the Congregational church. It was considered successful, although the attendance was not large.

Mr. Rantoul gave an interesting account of the Beverly cotton factory established by George Cabot and others. He showed conclusively that this was the first *American* cotton factory. It was located near the place of meeting. It has been claimed that the Pawtucket factory was the first of this kind, and that was started by Slater in 1790, but the Beverly factory was in operation two or three years earlier. General Washington visited it when he was here in 1789; and advertisements of the goods of the company appear in the *Salem Gazette* of 1788.

Prof. E. S. Morse and Mr. John H. Sears also spoke at this meeting, the former accompanying his remarks with graphic chalk illustrations.

During the past winter, papers have been read before the society in Plummer Hall by the following :

Prof. F. W. Putnam, of Cambridge, on the "Scientific side of the Columbian Exposition."

Prof. E. Charlton Black, of Harvard College, Cambridge, on "Heinrich Heine—Poet, Humorist and Reformer."

W. A. Mowry, Ph.D., on "The Inauguration of the New Government, or Washington as a Statesman."

Sidney Perley, Esq., on "The Geological Evolution of Essex County."

Alfred Stone, Esq., of Providence, R. I., on "The Great White City." This lecture was given in Academy Hall and was illustrated by lantern views.

Mr. Arthur L. Averill, on "How the Independence of the United States was obtained."

W. S. Nevins, Esq., on "The Career of Gen. H. W. Halleck."

Rev. G. T. Flanders, D.D., of Rockport, on "A Study of Martin Luther."

Reports of all these lectures have appeared in the daily papers.

Informal papers and talks have been given at our regular meetings at the rooms, by Professor Morse, Mr. Gardner M. Jones, Mr. Robinson, Mr. Phippen, Mr. Nevins, Mr. Sears and Mr. Hines.

There have been the past year 1173 donations to the cabinets from 127 different donors. These donations have been acknowledged through the mail and in the *Salem Gazette*.

The old meeting-house of the First Church continues to attract visitors. More than 8000 have visited it during the year.

Twenty persons have joined the society this year and nine members have died, as follows :

Samuel P. Andrews,	Miss Mary Eliza Gould,
E. Frank Balch,	J. T. Moulton of Lynn,
Gardner Barton,	Nathaniel Ropes,
James Emerton,	Mrs. James O. Safford,
Dr. Henry Wheatland.	

Two of our honorary members have also died, viz. :
Rev. Dr. Andrew P. Peabody and John G. Whittier.

It seems hardly necessary for me to remind members of the society of the great loss we have sustained in the death of our venerable and honored president Dr. Wheatland. As he had been incapacitated by sickness from taking an active interest in our affairs for more than two years, his absence from our rooms is not now as much felt as it was when he was first taken from his work ; but in certain ways we shall feel his loss more and more as years go by. This is not the place, nor am I the person, to pronounce any eulogy on the character of our late president.

You all know his devotion to the interests of this society, always the first and last in his thoughts.

Having known him intimately for nearly *half a century*, I have felt that I could do no less than say these few inadequate words. In this connection I will add that a memorial meeting in honor of Dr. Wheatland was held in Academy Hall, on Monday evening, April 17, at which appropriate addresses were made by Vice-Presidents Goodell and Rantoul, Prof. Edward S. Morse, George D. Phippen, Esq., and Rev. Dr. E. C. Bolles of New York. A large number of letters were received from distinguished persons at that time, — all of these with the several addresses will be printed in a memorial volume.

On the Sunday succeeding the death of Dr. Wheatland, the Rev. E. B. Willson preached a sermon in the North church on the character of our late president. This sermon has been printed by the society, and any member who has not already received a copy can have it upon application to the secretary.

Our membership is not increasing as fast as we could wish. We now number about 325 active members, but in a place of the size and reputation of our city we ought to have 1000 members, and these could probably be obtained if each member would do all he could to increase the number. Several have already aided materially in this way and we wish others could be persuaded to give their influence to this work.

The collections of the historical department continue to increase and it is a pity we have not the room to make a proper display of all our acquisitions. So much has been said on this point in the last two reports that it seems hardly necessary now to do more than refer to it again with the hope that our expectations may in the near future be realized, through donations or bequests enabling us to make the necessary additions to our buildings.

To-day we have received notice of a legacy from Joseph Henry Stickney of Baltimore, Md., of \$1,000. Mr. Stickney had often visited our rooms during his summer visits in this vicinity and was much interested in historical matters.

Something has been accomplished the last year in the arrangements of the manuscripts. Although our collection is a large one, like *Oliver Twist*, we are always asking for more, and we trust no member will be foolish enough to allow ancient MSS. of any kind, even old bills, account books, letters, etc., to be cast into the fire or otherwise destroyed if he can possibly prevent it. All this may sound very funny to some people and perhaps silly to others; but it is really a very serious matter sometimes to have old papers destroyed without an examination by judicious persons.

There is many a poor person to-day, who would perhaps be well off if some of the family papers relating to French claims had been preserved.

The committee on the Columbian Exposition at Chicago have done an efficient work during the year toward making a creditable exhibit in behalf of the Institute; but, as its labors have not yet ceased, the committee is not ready to make a report of its doings at present.

Respectfully submitted,

HENRY M. BROOKS,

Secretary.

REPORT OF THE LIBRARIAN.

The additions to the library for the year (May, 1892 to May, 1893), have been as follows :

By Donation.

Folios, ...	79
Quartos, ...	195
Octavos, ...	1,470
Twelvemos, ...	651
Sixteenmos, ...	238
Twenty-fourmos, ...	292
Total of bound volumes, ...	2,925
Pamphlets and serials, ...	13,211
Total of donations, ...	16,136

By Exchange.

Folios, ...	7
Quartos, ...	21
Octavos, ...	230
Twelvemos, ...	33
Sixteenmos, ...	28
Twenty-fourmos, ...	28
Total of bound volumes, ...	347
Pamphlets and serials, ...	1,909
Total of exchanges, ...	2,256

By Purchase.

Quartos, ...	1
Octavos, ...	41
Twelvemos, ...	3
Total of bound volumes, ...	45
Pamphlets and serials, ...	644
Total of purchases, ...	689
Total of donations, ...	16,136
Total of exchanges, ...	2,256
Total of purchases, ...	689
Total of additions, ...	19,081

Of the total number of pamphlets and serials, 7,416 were pamphlets and 8,348 were serials.

The donations to the library for the year have been received from two hundred and nine individuals and one hundred and eleven societies and governmental departments. The exchanges, from twelve individuals and two hundred and nine societies and incorporated institutions, of which one hundred and one are foreign; also from editors and publishers. Several hundred volumes have been received from the library of our late president, Dr. Wheatland, and the foreign exchanges of the Peabody Academy of Science, many of them extremely rare and valuable, have been added to our library. An appeal has been made during the year to the different towns of Essex County to complete our sets of town reports and the responses have been very satisfactory.

These statistics show the continued growth of the library which now numbers about 60,000 bound volumes and about 175,000 unbound volumes including pamphlets.

But while the library grows steadily, our facilities for taking care of the books have not increased. It is becoming, indeed it already is, a serious question, What shall we do to provide additional room for the storage of our books?

We have kept in mind the plan suggested in a previous report with regard to marking out special lines of work for the Public Library and the Essex Institute.

Our full collections of public documents, which would prove very valuable if properly arranged and indexed, we would like to deposit with the Public Library and confine the work of the Institute largely to local history, genealogy and kindred subjects.

But the Public Library is rapidly outgrowing its present quarters; and, until more accommodations are provided, which must be in the near future, has no room which it can use for the reception of the documents.

Even with this relief the library of the Institute would still want more room.

The only sufficient remedy would seem to be the building of a fire-proof addition, or stack room, in the rear of our present building, and this should be done as soon as the necessary funds can be obtained.

Another pressing need is some sort of a catalogue or finding-list of the library. A card catalogue of the volumes in the different rooms would be a great help to those using the library and a good foundation for a complete catalogue.

To do all this we are sadly in need of funds.

The first great need of the Institute is money, and the second is more money. Without this little can be done. With it the power of the Institute for good can be extended almost indefinitely. It is with no selfish motives that we appeal for aid. The more assistance we have the better the Institute can serve the community for whose benefit it was established and is maintained.

The use of the library, notwithstanding these drawbacks, has been very satisfactory and students in special branches of research find a large fund of material at their disposal.

With our society, as with all others, time brings about the inevitable changes, and death has stricken from our roll of membership the name of our honored and lamented president, Dr. Wheatland.

It remains for us to carry forward the good work for which he laid so secure a foundation, and the most fitting tribute we can pay to his memory, and the one he would most desire, is to strive to enlarge the usefulness of the Institute to which he gave so many years of unselfish devotion.

CHAS. S. OSGOOD,

Librarian.

EXPENDITURES.

Salaries of secretary, assistant librarians and janitor, . . .	\$2,177 00	
Cost of books, periodicals and binding, ...	392 26	
" " publications and printing, ...	1,204 03	
" " fuel, ...	202 50	
" " gas and water, ...	48 88	
" " repairs, ...	457 77	
" " insurance, ...	429 75	
" " interest on note, ...	150 00	
" " labor, etc., on the grounds and buildings, . . .	182 80	
" " Athenæum expenses (our proportion), . . .	258 18	
" " express, postage and miscellaneous, . . .	296 36	
Annuities, ...	660 00	
		\$6,459 53
Interest added to manuscript fund, ...	54 98	
" " " North Bridge monument fund, . . .	7 26	
		62 24
Balance of cash on hand,		378 37
		\$6,900 14

May 15, 1893.

Respectfully submitted,

WILLIAM O. CHAPMAN, *Treasurer*.

Examined and approved,

(Signed) GEORGE D. PHIPPEN, *Auditor*.

INVESTMENT OF FUNDS.

For income, ...	\$71,717 75
" Essex Institute building, ...	28,370 69
" Ship Rock and land, ...	100 00
Total investments,	\$100,188 44

Salem, May 15, 1893.

Examined the above account with the securities and found them correct.

(Signed) GEO. D. PHIPPEN, *Auditor*.

LECTURES.

Friday, Jan. 6, 1893.—Prof. E. Charlton Black, of Harvard University, lectured on "Heinrich Heine, —Poet, Humorist, Reformer." In introduction, Mr. Black spoke in a general way of Heine, his work as bearing upon the world, his character, his keen wit and perception and the chief facts of his strange, sad, significant life. He then gave a brief sketch of his life, and of his parents, how

his mother was well educated, and from her he inherited all his finer qualities, while from his father was due the less desirable side of his character. He touched upon his school life at a convent, telling several anecdotes of his difficulty with irregular verbs and other boyish perplexities.

His early life was much influenced by the power of Napoleon, then at its height. His whole life was greatly dominated by the French point of view, and in this connection he touched upon his song "The Two Grenadiers," so beautifully set to music by Schumann. At this point he dwelt at length on the inadequacy of translators to do him justice, and the general bad piece of work they made of it, but added that after all even a poor translation is better than none.

On leaving school at sixteen he went into a banker's office, but through the kindness of a wealthy uncle was sent to college to become a lawyer. He attended the universities of Bonn, Gottingen and Berlin, doing but little real study, although in 1825 he took his degree and at the same time was baptized a Christian as a necessary means for his practising his profession; this act subjected him to severe criticism by both Jew and Christian, his friends and his enemies, and placed him in a most unfortunate situation. During his residence in Berlin he occupied a strong position socially both among the Jews and the others as a literary genius. One of the phases of his life was his engagement to a cousin who, during his university career, married another man and in so doing deeply affected his sensitive nature.

His keen wit was shown in several illustrations, one of the best being his description of his old college town of Gottingen, which was a satire of phariseeism and littleness, and another his handling of a certain college professor who railed at Napoleon.

He visited England and was disgusted, ridiculing everything he saw. His Paris life was brilliant and famous until 1848, when he had a sort of paralytic stroke that left him half lame and blind. His last days were sad, pathetic and most unhappy. His description of what his old age would be, as pictured to his German eyes, is most touching, being very tender in its allusions. He died February 16, 1856, and was buried at Montmartre, his resting-place being marked with the simple inscription — Heinrich Heine.

Monday, Jan. 16, 1893.—A series of informal meetings for members only was begun in the library rooms. Mr. Gardner M. Jones opened the literary exercises by some interesting remarks on the library of the Institute, historical and statistical, and also in relation to its needs in order to increase its usefulness. He closed by calling attention to a number of books taken from the shelves, illustrating the work of celebrated book-makers and printers and covering the whole period of printing from 1486 to the present time. Mr. C. S. Osgood followed endorsing what Mr. Jones said as to the needs of the library and stating that had the Institute the necessary funds, the library committee would do practically what had been suggested. Prof. E. S. Morse spoke of the collecting of books and kindred matters and referred to persons well known in science, suggested by some of the books. After informal remarks by several other members the meeting adjourned.

Monday, Jan. 23, 1893.—William A. Mowry, Ph.D., of Salem, lectured on "The Inauguration of the New Government, or Washington as a Statesman." Dr. Mowry first spoke of the period of the formation of the first Con-

tinental Congress representing the thirteen original colonies, at the beginning of the Revolution, and the difficulties it labored under. He said it was a marvel that the war was successfully carried out under such conditions as then existed, with our little colonies poorly equipped, with a scarcity of supplies and with but little experience and want of training against the fearful odds of the large armies and supplies of England. Our victory was not due to superior fighting, but more than anything else to the sagacity and wonderful ability of General Washington. Then came the necessity for a new order of things; the articles of confederation of 1777 had no power to tax the states or do anything of a positive nature; business was ruined and amendments were proposed repeatedly which could not be passed, owing to the antagonizing state of feeling and jealousy between the states. It was the most critical period in our history. In 1787 a general convention was held in Philadelphia, a new constitution drawn up, discussed, amended and signed, and after a long and excited discussion in the several states, was adopted in the course of the next year. Rhode Island, however, did not adopt it until the beginning of 1790. Party spirit ran as high at this time as it ever has since.

The lecturer made some reference to the position of Patrick Henry on the new constitution and to the misstatements about the life of that patriot. In conclusion he spoke at some length of the national power and growth of our country with its possibilities and undeveloped powers and of the exigencies that have never yet been met by any nation, but will of necessity arise.

Monday, Feb. 6, 1893.—Mr. John Robinson gave an informal talk on the old houses of New England. It was an interesting sketch of the houses of our forefathers from

the time of the settlers in 1628-30, when the old lean-to was universal, up to 1700 when the hip roof was prevalent. This style lasted until about 1750 at which time and up to 1780 came the elegant structure of which Judge Endicott's and the Peabody house in Danvers are good illustrations as was also the Pickman house on Essex street. After this came what is wrongfully called the colonial, the fine square house with its graceful doorway, windows and much interior decoration, of which there are many fine types in Salem. In illustration he cited houses in Salem, Boston, Newburyport and Portsmouth. The different periods of architecture referred to were not drawn in arbitrary lines, but overlapped each other.

Monday, Feb. 13, 1893.—Sidney Perley, Esq., of Salem, lectured on "The Geological Evolution of Essex County." Mr. Perley traced the gradual development of this county into a habitable place through the earliest geological periods, giving scientific causes for and the origin of the different sorts of rocks which are found in the county. He stated that New England was probably the oldest part of this continent, as well as of the earth. Illustrating the various stages of development, he quoted the pockets of lead at Newbury and the earthquake at the same place in 1727.

Plum Island, he said, was a perfect example of the formation of islands by sand bars. The rocking stones of Gloucester he accounted for by the erosion of frost and water. Speaking of the bog iron deposits, he stated that iron was first worked from these bogs in Lynn in 1642-3, in Boxford, 1668, and Amesbury in 1728.

The surface formation of Essex county, as it now exists, was largely caused by the action of the glaciers, they having brought and deposited here large quantities of sand,

gravel and rocks and having moved the surface soil from place to place. In this connection the lecturer mentioned the gravel ridges extending from Andover to Beverly as being caused by the settlement of the moraines of the glacier, also many hills in Boxford and other places and other deposits of boulders, etc. The course of the Merrimac river was also claimed to have been changed from its original direction by the deposit of similar moraines or ridges of gravel and sand beginning at Lawrence.

Mr. Perley suggested that the members of the Essex Institute interest themselves to a greater extent in the study of geology, and that they cause to have made a surface survey of this section of the country.

Monday, Feb. 27, 1893.—Mr. Alfred Stone, of Providence, lectured in Academy Hall on "The Great White City; or an Architect's View of the World's Exposition Grounds and Buildings." His remarks were illustrated by a series of stereopticon views taken from the buildings now completed and also under process of construction. Mr. Stone first showed a plan of Jackson Park as it was, a desolate swamp, and then a map of the grounds and locations as they have been arranged for the exposition.

He then proceeded to describe and show by his views the principal buildings. The Administration building he termed one of the finest examples of architectural art. The Manufacturers and Liberal Arts building he described fully; said that Bunker Hill monument set down in the main aisle, would not reach to the top of this building; at the time of the dedication exercises, 90,000 were seated in this building. The other buildings were shown and described. He spoke enthusiastically of the proposed exhibit by the Institute at the fair, to be in the Massachusetts building, regretting that he was unable to show a picture of that building.

Monday, March 6, 1893.—Mr. W. S. Nevins gave an informal talk illustrated by photographs and books, on "Famous Madonnas." He said "The first mention of worship of the Virgin Mary occurs in the work of Epiphanius who died in 403, who mentions a sect of women with whom it was customary to offer cakes of meal and honey to the Virgin Mary. It was about the year 431 that the first representation of the Virgin and child appeared in the Egyptian type of Iris. About this time the Empress Eudoxia sent home from the Holy Land a picture of the Virgin holding the child, alleging it to be an authentic portrait."

The lecturer referred to a Madonna in Constantinople, said to have been carried to St. Mark's, Venice; to the Madonnas of the coronation type, the mercy type and of the Mater Dolorosa, and made mention of the famous masters, Raphael, Murillo, Van Dyke, Guido, Rubens, Angelo and De Vinci. Reference was made to the models from whom the most famous Madonnas were made and a comparison was made between the artists and their works.

Monday, March 13, 1893.—Mr. Arthur L. Averill, of this city, lectured on "How the Independence of the United States was obtained." In introduction, he outlined the condition of affairs of this country prior to the great revolutionary struggle. The American army, with its free enlistment and patriotic feeling, was more than an equal for an even larger force of hired and perfunctory soldiers. He cited several instances of the losses of the British through faults of their own commanders in indulging in proffered hospitality or in gambling. Those who have always been brought up in luxury do not make as good officers as those who enter the army from principle or with a set purpose. This he illustrated with the life of Napoleon.

He then began an outline of the war from the very start, describing every important event, with side issues of the many naval engagements and the horrors and injustices of the "press gang." He dwelt on the privations and suffering of the cold winters, which our army bravely endured.

He then referred to the able administrations of the early presidents and the growth of the country under their careful guidance, and then spoke of the famous naval engagements of the war of 1812, in our second struggle for independence with Great Britain and the splendid victories that were fought at very uneven odds, showing the superiority of the American seamen.

Monday, March 20, 1893.—Mr. Ezra D. Hines, of Danvers, gave an exceedingly interesting account of the correspondence that he had with persons in Virginia and North Carolina, which finally resulted in his procuring through the kindly assistance of Mr. T. F. Hunt and Mr. Frank Cousins, fine photographs from the original portraits of Mr. and Mrs. William Browne of Browne Hall fame, he having built that mansion on "Folly Hill" in Danvers. The portraits were formerly at Rosewell, the old Page homestead in Gloucester county, Virginia.

Mr. John H. Sears of the Peabody Academy of Science, read a paper on the geological formation of the neighborhood of Cape Ann. Interesting remarks were made by Mr. John Robinson and Professor Morse, complimentary to Mr. Sears, as showing the valuable work done in Essex County by him.

Monday, March 27, 1893.—Winfield S. Nevins, Esq., of this city, lectured on "General H. W. Halleck." Mr. Nevins said that it was quite remarkable that one man who had had so little military experience as General Halleck,

should have been called to the position of General-in-Chief and continued in that office for nearly two years. General Halleck was born in Waterville, N. Y., Jan. 15, 1815, and died in Louisville, Ky., Jan. 9, 1872, at the age of fifty-seven. He was graduated from West Point in 1839 and served in various minor capacities in the army until 1854, when he retired and practised law in California. Upon the breaking out of the civil war he was made Major-General in the regular army and assigned to command in the west. The speaker proceeded to give some account of a few of the movements in the war, including victories by various generals as those of Grant, Pope and Buel and thought that Halleck was more to blame for slowness in movements of the Army of the Potomac than McClellan; he also made him responsible for the defeats of Burnside at Fredericksburg and Banks at Red River. He said he made these statements on the authority of government official records.

Monday, Apr. 3, 1893.—Mr. George D. Phippen spoke of the spring flowers and made some interesting and instructive remarks on cultivated fruits and of the importance of turning scientific investigations to practical account.

Monday, Apr. 17, 1893.—A memorial meeting in honor of Dr. Henry Wheatland, the late president, was held in Academy Hall. Vice-President Abner C. Goodell, Jr., presided and addresses were made by His Honor, Mayor Robert S. Rantoul, Mr. George D. Phippen, Prof. Edward S. Morse and Rev. E. C. Bolles, D.D., of New York. Mr. Goodell introduced each speaker with appropriate remarks.

A full account of this meeting is to be printed in a separate pamphlet.

Monday, Apr. 24, 1893.—Rev. G. T. Flanders, D.D., of Rockport, lectured on "A Study of Martin Luther." The speaker summed up the subject as follows:—Luther was social, affectionate and fond of relaxation and fun. Carlyle says,—"one of the most lovable of men, great as an Alpine mountain, so simple, honest and spontaneous; not setting up to be great at all, but here for quite another purpose than being great." The lecturer said "Luther's system of theology is dying out, but his sturdy blows for a free Bible and free thought will long ring adown the ages, and the verdict of the remotest posterity will be that taken, for all in all he was the grandest man Germany has produced." Mr. Flanders gave a comprehensive review of the famous man's life, and an analysis of his character.

NECROLOGY OF MEMBERS.

SAMUEL P. ANDREWS, son of John H. and Nancy (Page) Andrews, was born in Salem, Dec. 8, 1813; elected a member of the Essex County Natural History Society, Mar. 12, 1844, and of the Essex Institute, Aug. 10, 1853, and died in Salem, Dec. 31, 1892.

E. FRANK BALCH, son of Benjamin and Caroline (Moore) Balch, was born in Salem, Nov. 27, 1842; elected a member of the Essex Institute, Nov. 18, 1878, and died in Wenham, Aug. 29, 1892.

GARDNER BARTON, son of John and Mary (Webb) Barton, was born in Salem, July 23, 1815; elected a member of the Essex Institute, Mar. 8, 1854, and died in Salem, July 15, 1892.

JAMES EMERTON, son of James and Hannah (Mansfield) Emerton, was born in Salem, Oct. 14, 1817; elected a

member of the Essex Institute, Mar. 8, 1854, and died in Boston, May 31, 1892.

MARY ELIZA GOULD, daughter of Robert W. and Sarah (Osgood) Gould, was born in Salem, Oct. 3, 1819; elected a member of the Essex Institute, Nov. 18, 1875, and died in Salem, Aug. 22, 1892.

JOHN T. MOULTON, son of Joseph and Relief (Todd) Moulton, was born in Lynn, Aug. 7, 1838; elected a member of the Essex Institute, Nov. 18, 1872, and died in Lynn, Oct. 17, 1892.

NATHANIEL ROPES, son of Nathaniel and Sarah E. (Brown) Ropes, was born in Cincinnati, O., Jan. 7, 1833; elected a member of the Essex Institute, Feb. 9, 1870, and died in Salem, Feb. 6, 1893.

MRS. NANCY M. SAFFORD, widow of James O. Safford, and daughter of James and Lydia (Eustis) Potter, was born in Salem, Jan. 23, 1831; elected a member of the Essex Institute, Jan. 3, 1876, and died in Salem, Mar. 5, 1893.

DR. HENRY WHEATLAND, son of Richard and Martha (Goodhue) Wheatland, was born in Salem, Jan. 11, 1812; elected a member of the Essex Historical Society, Sept. 6, 1841, and of the Essex County Natural History Society in 1834, and died in Salem, Feb. 27, 1893.

Donations or exchanges have been received from the following sources :

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GEOLOGICAL AND MINERALOGICAL NOTES.

No. 6.¹

ON THE OCCURRENCE OF AUGITE² AND NEPHELINE³ SYENITES IN ESSEX COUNTY, MASS.

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(Curator of Geology and Mineralogy, Peabody Academy of Science, Salem.)

IN a short paper by Dr. M. E. Wadsworth on the presence of syenite and gabbro in Essex County, Massachusetts, published in the Geological Magazine (Decade 3, Vol. 2, No. 5, 1885), Dr. Wadsworth says: — "Much of the eastern coast of Essex County, Massachusetts, extending from Salem to a point beyond West Manchester, has been found by the writer to be occupied by a typical

¹ This paper forms a more complete report of geological and mineralogical notes No. 5 (Bulletin of the Essex Institute, Vol. XXV, 1892).

² Augite-syenite, Vom Rath. This term was introduced by Vom Rath for a class of rocks occurring near Predazzo in the Tyrol.

³ Nepheline-syenite, Brögger. Nepheline and augite syenites of Norway. (Die Silurischen Etagen 2-3.)

syenite of a reddish and grayish color, which in its macroscopic characters appears to be identical with that from Plauen'schen Grund, Saxony. The syenite in places contains much biotite, and also near West Manchester, quartz grains (segregations?). This syenite is often cut by dykes of a fine grained grayish syenite, which hold the same relation to the syenite proper as the micro-granite dykes do to the granite of the region, and hence, for convenience of description, the rock of the syenite dykes may be styled micro-syenite.

A careful study of the rocks of Cape Ann made during the past three years has led to certain conclusions, which are presented in the following pages, together with their macroscopical, microscopical and micro-chemical analyses and the extent of the principal outcrops and the general trend of the whole rock-mass."

I. DESCRIPTION OF THE ROCK-MASS AT THE VARIOUS OUTCROPS.

This rock is distinctly plutonic in the coarse massive granitic areas, while in the finer granitic forms it has all the characters of eruptive flows when viewed on the surface of the outcrops, but an examination of sections in some of the deserted quarries shows that these flows were due to local variations of the plutonic magma. Probably this is the micro-syenite of Dr. Wadsworth. There are dyke forms, which are intrusive in the hornblende-granite of the region. The syenite rock varies in color from reddish and bluish to all shades of gray and light green, as seen in fresh specimens taken beneath the surface, while on the surface it is weathered to a dull reddish gray. In all cases the rock mass in fresh unaltered specimens consists of a compact tough aggregate of well crystallized minerals in which long porphyritic feldspar crystals are

more or less thickly scattered. In some of the outcrops these crystals are tabular, so that there is a conspicuous development of the clinopinacoid plane, giving the surface a decided porphyritic appearance, while in other places crystals showing the basal plane are more abundant, giving the surface of the rock-mass a distinctly tessellated appearance.

II. MACROSCOPICAL CHARACTERS.

The rock in the hand specimen is extremely variable. Specimens from the southern end of West beach, from West Manchester and from Winter island are of a decidedly coarse well crystallized felspathic rock with a little hornblende and biotite. Numerous specimens from various outcrops in Salem, Beverly, Essex, Manchester and Gloucester of the more typical rock are all of a decidedly similar type, being composed of coarse well crystallized minerals, the recognizable ones being orthoclase, pyroxene, hornblende, biotite, magnetite and a little quartz. The color of these specimens is a grayish green. At other outcrops, as on the hill in the city of Gloucester, which is used for the purpose of road building, at Powder House hill in Essex, at a cutting on the road side in Lanesville, opposite Young avenue, and at Poor House hill in Beverly, this rock is of a dark green color, almost black, which, if examined with the pocket lens and with the usual field apparatus could only be considered a porphyritic pyroxene-hornblende rock. At Thompsonville in Essex, and extending to the Loaf on Coffin's beach and nearly the whole length of the Squam river, there are varieties of the augite-syenite rock. Other outcrops are found at Wheeler's Point, Pierce's island, Rust's island, and by the roadside towards Coffin's beach in West Gloucester, and also in the cellar of the Russia cement works in West Gloucester. At

these outcrops the rock is granitic in character and contains considerable quartz with hornblende and biotite. The porphyritic feldspar is often quite fresh and glassy and therefore this rock, or the series of outcrops last mentioned, if studied by themselves in the field, would have every appearance of fine-grained hornblende-granitites. Several outcrops in Beverly and Essex, which are of the same type, are seen to be varieties of the augite-syenite group. Another phase of these rocks, as observed in the field, is in the form of massive flows of the micro-syenite previously mentioned. Certain outcrops of this form are seen at Conomo, Essex, Blind brook, Braywood, West Gloucester, at the hill south of the Cape Ann forge works, and extending to the outcrop used for road building by the city of Gloucester. Another extensive outcrop is seen from Rocky Neck, East Gloucester, extending across Pleasant avenue and East Main street to Bass Rocks, near the corner of Fair View avenue and again on Salt island, Briar Neck and Emerson's point, Rockport, and extending to Gap Head in the village of Rockport are seen tongues and veins of this same flow structure. Smaller masses from ten or twelve feet long and half as wide to as many rods in length and width, are seen on all parts of the area covered by these syenites. There are also several intrusive dyke rocks which must be classed as rocks of more recent age than the mass of this augite-syenite, one of which proves to be a phonolite dyke rock of the type called by Rosenbusch,¹ *tinguaite*. This dyke cuts the hornblende granite 200 yards southwest of Singing beach, Manchester. On the surface this rock has weathered to a dull whitish gray with numerous porphyritic feldspar crystals standing out upon it. In the fresh rock the color is a greasy olive green, in texture it is very compact and ex-

¹ Min. Phys., Vol. II, p. 627.

ceedingly tough. Two forms of porphyritic crystals are seen, one glassy, long, lath-shaped and the other dull, white and hexagonal.

III. THE MICROSCOPICAL STRUCTURE.

Thin sections of the phonolite dyke rock, when studied under the microscope in polarized light, show that it is composed of some crystals of sodalite, hexagonal in outline, and numerous long irregular feldspar phenocrysts which are sometimes in Carlsbad twins with a quite fine multiple twinning and in one section the double twinning of the microcline structure. Several of the feldspar crystals have a perfect, square, cross-section which is very noticeable and suggests a resemblance to the anorthoclase phenocrysts which were described in my paper on keratophyre¹ from Marblehead Neck. Micro-chemical tests of this feldspar in hydro-fluosilicic acid give, upon evaporation of the acid, equal numbers of crystals of sodium (Na_2O) and potassium (K_2O), but with no calcium (Ca O); sp. gr. 2.572 to 2.58. The analysis of the anorthoclase feldspars in the keratophyre rock which was made at the laboratory of the U. S. Geol. Surv. at Washington by Dr. Thomas Chatard gives K_2O , 6.98; Na_2O , 6.56. This micro-chemical test, therefore, shows that the feldspar in this phonolite rock is very near if not chemically equal to anorthoclase. The hexagonal outlines of the sodalite phenocrysts are isotropic and the mineral gelatinizes readily with acid which upon evaporation gives an abundance of common salt crystals. There are also some crystals of green augite and brown hornblende, one of the outline hornblende crystals being filled with minute crystals of ægirine. The holo-crystalline ground mass is

¹ ² Bulletin of Museum of Comparative Zoölogy at Harvard College, Geological Series, Vol. II, June, 1890.

composed of feldspars and feebly polarizing nepheline in a nearly complete felting of ægirine crystals and grains, some of which sink to the finest dust. These ægirine grains are so abundant in the feldspars of the ground-mass that the specific gravity of the feldspar in the rock powder, even after passing through the 100 sieve, could not be clearly made out, but with the inclusions of ægirine it was as low as 2.59. This rock powder gelatinized readily with acid and, upon evaporation, an abundance of gypsum crystals appeared, thus characterizing some of the minerals in the ground-mass as belonging to the hauyne group. In a communication received at a late date (June 17), from Prof. H. Rosenbusch, in relation to this rock he says: "Specimen No. 4 is a very good representation of the dyke rocks which I have called *tinguaite*. Phenocrysts of orthoclase in scarce quantity are disseminated in a holocrystalline mass of feldspar, nepheline and augite. I feel very sure there may be some *lucite* in it, but I did not succeed in proving it until to-day." The letter is dated June 6, 1893. With this determination the phonolite dyke rock would, therefore, be a *lucite-tinguaite*.

The microscopical structure of the typical augite-syenite from various outcrops is as follows:—Thin sections prepared from specimens collected in an old quarry on the W. D. Pickman estate at Beverly Cove; numerous large porphyritic crystals of microcline-microperthite,¹ some multiple twinned plagioclase, probably labradorite, much orthoclase, augite in two forms, one in large ragged crystals, and the other in long needle-shaped crystals enclosed in the feldspars as microliths, numerous small ragged crystals of ægirine, some brown hornblende, red biotite in large

¹ This form of feldspar is characteristic of Professor Brögger's microcline-microperthite in the augite-syenite rocks of Norway.—Brögger, *Min. der Syenite* Py., p. 627.

patches, numerous perfect zircon crystals, fine sections of nepheline, some apatite and magnetite with a ground-mass of thin films of quartz.

Sections prepared from the outcrop on the east side of Briscoe Hill in Beverly are of similar composition, but contain in addition olivine and titanite. At the ledge used for road building purposes on Poor House hill, Beverly, there are two well marked forms. One is rich in hornblende, contains little augite and has much quartz, not only as a ground-mass but also as distinct patches with fine large crystals of microcline-micropertthite (the soda-microcline of Professor Brögger), some ægirine crystals, apatite and magnetite. The other is rich in augite, still having considerable quartz, some hornblende, biotite, ægirine and nepheline. The first, except for the ægirine and microcline-micropertthite, would be classed as hornblende-granitite. The other is nearly if not quite like the typical augite-syenite. In this last a vein of pyrrhotite of a rich yellow bronze color is seen which carries a small percentage of nickel. Molybdenite also occurs in this outcrop.

Several thin sections of the rock in the massive outcrop near Magnolia Station, and in the railroad cutting one hundred yards east of the station, when studied with the polarizing microscope, were found to be composed of microcline-micropertthite, well twinned plagioclase, orthoclase, augite, green hornblende, red biotite, zircons, apatite, fine sections of titanite, much magnetite, some limonite, nepheline and isotropic sections of sodalite which gelatinized readily with hydrochloric acid. Some sections also contained regular crystals of hypersthene and some well formed crystals of olivine, and in one of the sections there were large patches of elæolite. The color of the whole rock mass in fresh hand specimens is dark grayish and green. This rock is

thus shown to be quite distinct from any member of elæolite-zircon-syenite group heretofore described, inasmuch as it contains hypersthene and olivine without a glassy ground-mass, and it is equally distinct from the typical augite-syenite of Vom Rath. We, therefore, have a distinct variety in this Magnolia outcrop. Sections from the Lanesville outcrop opposite Young avenue contain olivine. In some of the sections serpentine has developed in the cleavage cracks and some of the feldspars have the microscopical characters common to anorthoclase, extinguishing by sections and in patches. This is the soda-microcline of Professor Brögger (*Zeitschrift für Krystallographie*, Vol. xvi, page 261). One section shows multiple twinned albite intergrows directly across the twinned microcline, giving it a very beautiful appearance when seen in polarized light. This form is characteristic of Professor Brögger's microcline-microperthite in the augite-syenite rocks of Norway. There are also numerous irregular fragments of ægirine and a few small triangular patches of nepheline with a ground-mass of quartz as a cement.

At the augite-syenite outcrop in Brace's Cove, East Gloucester, and by the roadside on the sand beach near the Niles farm buildings, on the southwest side of Eastern point, the large, almost perfect tabular feldspar crystals give this rock a very striking appearance. The microscopic structure of thin sections, when studied with the polarizing microscope, gives the following minerals in its composition: much augite, green hornblende, glaucophane and chlorite as secondary products in the decomposition of the hornblende, microliths of ægirine, one characteristic crystal of hypersthene, magnetite, limonite, numerous zircon and apatite crystals, orthoclase, microcline-microperthite, some plagioclase, and a little quartz as the ground-mass. The large tabular porphyritic crystals of feldspar are micro-

cline-microperthite. The outcrop of this augite-syenite, in the marsh near the poor farm, used by the city of Gloucester for road making, is of a very dark color and a macroscopical examination would indicate it to be diorite, but the microscopical structure, as seen in thin sections, shows it to be composed of augite, ægirine, hornblende, limonite, some biotite, orthoclase, microcline-microperthite, zircons, apatite, magnetite and a little quartz as a cement in the ground-mass, thus making the rock a typical augite-syenite. Numerous thin sections have been prepared from all parts of the outcrops of this augite-syenite described above. In specimens from the corner of Warner and Prospect streets in the city of Gloucester, the microscopical structure is quite characteristic of this rock mass. They all contain augite, ægirine, titanite, microcline-microperthite with some quartz. Some of the sections contain nepheline and one section contains an excess of the fine multiple twinned albite (sp. gr. 2.63). There is more or less orthoclase, hornblende, biotite and magnetite with crystals of zircon and apatite as inclusions in the feldspars, showing this rock mass to be a nearly typical augite-syenite.

From the area mapped as diorite (9th Annual Report of the United States Geological Survey: Geology of Cape Ann by Prof. N. S. Shaler) in Gloucester and the islands in Squam river, I have collected specimens from every outcrop. These have been carefully studied and compared with known types of the augite-syenite group from other parts of the region and, after making thorough microscopic analyses of numerous thin sections, I am convinced that these outcrops are phases of the augite-syenite rock. The microscopical structure, when studied from thin sections in polarized light, shows these outcrops to be composed of augite-syenite minerals, microcline-microperthite

and the soda-microcline which are characteristic minerals described by Professor Brögger as occurring in the augite-syenite rocks of Norway. Thin sections prepared from specimens collected on Pierce's island in Squam river have the following mineral composition: Nos. 1, 2, 3, contain numerous patches of red biotite, hornblende and augite, in perfect crystal form, microcline, orthoclase, microcline-micropertthite, microliths of ægirine, and numerous inclusions of zircons, apatite and magnetite, the whole cemented in a coarse ground mass of quartz. Thin sections prepared from specimens collected in an old and deserted quarry on the northeast side of this island are much more porphyritic. The larger crystals are always microcline-micropertthite (sp. gr. 2.60 to 2.64). One of the sections has fine crystals of titanite and the quartz is in thinner films as a ground-mass or cement, otherwise the minerals are of a similar character to Nos. 1, 2, 3, except that no ægirine was detected. Specimens were collected from various outcrops along Essex avenue and Concord street to a point near Coffin's beach, West Gloucester. Sections, from an outcrop on the side of the road to Coffin's beach, near a deserted quarry in West Gloucester, are of a fine grained rock, slightly porphyritic, with an abundance of biotite, perfect well twinned crystals of albite, much microcline in large irregular patches, microcline-micropertthite, hornblende, augite and titanite, some of the orthoclase feldspars having areas of micropegmetite. From the great abundance of biotite in this rock mass it may be locally called biotite-augite-syenite (sp. gr. of feldspars in this rock 2.57 to 2.62). Thin sections from the augite-syenite outcrop at Wheeler's point, Gloucester and extending to Goose Cove, Annisquam and Bay View, give the microscopic structure as follows:—Nos. 1, 2, Wheeler's point, numerous large porphyritic crystals of microcline-

micropertthite, albite and orthoclase, good crystals of augite, hornblende, ægirine; numerous crystals of titanite, some biotite, magnetite, a little quartz, some crystals of apatite and zircons. No. 3, section from Goose Cove, is the same as the last except that it does not contain ægirine. Nos. 4, 5, 6, sections from Bay View quarries, contain more augite and ægirine. In one section, No. 5, there is a complete felting of these ægirine crystals which sink to the finest dust as inclusions in the microcline-micropertthite, giving the rock a deep green color. Several thin sections, prepared from specimens collected in East Wenham, Essex, Conomo Point and on Cross' island, have the same microscopical structure but are more nearly of the typical augite-syenite. Thin sections from outcrop at Conomo point are nearly the same as from the outcrop at Lanesville except that they contain diallage instead of olivine, and sections from the massive outcrop at Powder House hill in the village of Essex contain long acicular crystals of brown acmite instead of the usual ægirine found in the various outcrops of the augite syenite.

Another phase of the augite-syenite rocks is found in the flow structures previously mentioned. When studied from thin sections under the microscope in polarized light they are seen to be different in structure from any variety previously described. The minerals are largely microcline-micropertthite, orthoclase and albite. These are by the addition of quartz grains again broken up into a micropegmatite forming a beautiful mosaic. Other minerals are augite, titanite, hornblende, biotite, hexagonal sections of sodalite, numerous zircons, some colorless garnets and magnetite. In some of the sections there are fine masses of glaucophane a probable decomposition product of hornblende. One section has microliths of ægirine in the orthoclase and larger quartz grains. When preparing the preliminary

paper (Geological and Mineralogical Notes No. 5), I considered part of this formation to be a granophyre. In the microscopical investigation made of loose grains of all these augite-syenites, the specific gravity of the feldspars in the crushed rock, as passed through the 90 sieve and separated in the Thoulet solution, has been obtained of all the specimens from which these microscopic sections have been prepared, giving the same general result, as determined by the Westphal balance, 2.65 for the quartz and some albite, 2.57 for the microcline and orthoclase; lighter minerals ranging between 2.55 for nepheline and 2.28 for sodalite have been found.

IV. THE EXTENT AND TREND OF THE WHOLE SERIES OF THESE SYENITES.

The trend of these syenites in Essex County, Mass., is from southwest to northeast. The most distant southwestern outcrop observed is in Lynnfield Centre, near Pilling's pond, in an old railroad quarry. From this point, across Peabody to Salem and Marblehead, and, extending across Salem harbor, it is seen on the shore line, in connection with the elæolite-zircon-syenite, from Beverly to the Singing beach and Eagle head in Manchester. From here to the railroad cutting at Magnolia it is continuous and crossing the great Magnolia swamp it is seen again at West Gloucester, in the city of Gloucester, at Eastern point and the islands and rocks known as Bemo ledge, Salt island, Milk and Thatcher's islands and the Salvages outside of Pigeon Cove, Rockport. It also occupies part of the main land, one outcrop being the so-called black granite of the Rockport Granite Company's quarries, and numerous tongues are seen extending into the hornblende-granitite at Gap head and on Emerson's point. The west and north-west line of contact across Beverly is extremely irregular,

commencing on Briscoe hill in the centre of the village the line of contact with the hornblende-granitite of Powder house hill is seen on Essex street, by the roadside near the cemetery, the contact at this point being quite plain in a northeasterly direction. From here numerous outcrops can be traced to Coy's pond, East Wenham and the Chebacco lakes, whence a long tongue extends in a north-westerly direction across Hamilton nearly to Vineyard hill. It occupies the entire area from Cutler's pond in Hamilton to Powder house hill in Essex, Conomo point, Cross' island, Thompsonville, Essex, to West Gloucester, the southwest side of Annisquam and Bay View to the outcrop opposite Young avenue, Lanesville, thus forming a circle nearly around Cape Ann. The largest area occupied by these augite-syenite rocks is in Salem, Beverly, Essex and Manchester; an area eight miles in length by six miles in width besides an area nearly equal in extent, in Gloucester, including Eastern point and West Gloucester. The outcrops at Bay View and Lanesville are probably connected with the larger mass in the city of Gloucester, under a drift covered valley, which is quite extensive and well marked to the east of Riverdale and which extends nearly to some of the outcrops at Bay View and Lanesville. It is clear that the drift covered valley occupied by the Boston and Maine railroad between Gloucester and Rockport may cover a narrow vein of the syenite connecting those at the Rockport Granite Company's quarry (the so-called black granite) and the dry salvages with the main mass at Gloucester. It will be seen, therefore, that the augite-syenites form the principal rock mass of Cape Ann and that the hornblende-granitites occupy a secondary place in this large area of granitic rocks. I include as Cape Ann all of the area given in the state atlas covering parts of Beverly, Essex and Manchester together with Gloucester and Rockport.

IN CONCLUSION.

The geological age of the granitic rocks of which this paper treats is undoubtedly post Cambrian as large and small fragments of the metamorphosed Cambrian sediments are often seen to be included in them. On Poor house hill, in Beverly, and Conomo Point, in Essex, examples of these included Cambrian rocks are met with on all sides. In regard to the relative age of these rocks as compared with the hornblende-granitite, the granitite is the younger rock; for the massive forms of the augite-syenite are not seen cutting the granitite but usually surround it, thus forcing the conclusion that the granitites have burst up through the augite-syenites. The micro-syenite and tinguaitite dyke rocks are more recent for they often cut both the granitite and the massive augite-syenite. Dr. M. E. Wadsworth in his paper on the presence of syenite in Essex County, Mass. (*Geological Magazine*, Decade 3, Vol. 2, No. 5, p. 207), says, "The preponderance of evidence is that the granite is the younger rock unless it is contemporaneous with the syenite." In the 9th Annual Report of the U. S. Geological Survey (*Geology of Cape Ann, Mass.*, by Prof. N. S. Shaler), the rocks of this area were mapped and classified as hornblende granitite, with the exception of a small area in Squam river and vicinity which was mapped as diorite. This so-called diorite, as is shown in the microscopical analyses of thin sections from all parts of the area described, is composed of augite-syenite minerals and the few sections that were wanting in some of these minerals would be nearer a fine grained hornblende-granitite than a diorite. The city of Gloucester is built almost entirely upon this augite-syenite. It was stated in the text of the Geological Report that the ledge at Magnolia and the islands on the coast were syenitic in character, but on the map of the

Cape Ann region, printed in connection with the report, these areas were recorded as hornblende-granitite. In the whole area of the augite-syenite rock there are several dome shaped and irregular masses of the hornblende-granitite and, as the two forms of rock are distinctly granitic in type, it is not surprising that they have long been considered as one formation. Indeed, on the surface of some of the eroded augite-syenite outcrops, secondary quartz has been developed to such an extent that it would be impossible from a macroscopical examination to distinguish them from the hornblende-granite rocks, while a few inches deeper, in the fresh unaltered mass, the absence of quartz would at once show that the formation belonged to the syenite rock group.

Paper read before the Essex Institute, Mar. 20, 1893.

THE ANTERIOR CRANIAL NERVES OF PIPA AMERICANA.

BY G. A. ARNOLD.

THIS study was undertaken to extend the method of serial sections so successfully employed by Von Plessin and Rabinowicz ('91) on *Salamandra maculata*, to one of the Anura. The embryos of Pipa, which form the basis of the study, had a body length of 9 mm. and were cut transversely into sections $22\frac{1}{2}$ micra thick, stained with alum cochineal and Bleu de Lyon (the latter after Röse's method ('91), and the reconstructions were made by plotting the projections of the sections on cross-section paper. It is only by such methods that detailed and conclusive knowledge can be obtained of the distribution of the nerves in the smaller forms. Since this method has been used in so few instances, comparison with other Batrachia is impossible and so the text is solely descriptive. It is, in fact, but an extended explanation of the plate to which reference must be made for all details. In my account of the several nerves, I have omitted detail with regard to such features as are common to all Batrachia and have dwelt more especially from points previously unknown or apparently peculiar to this form. So far as I am aware the nervous system of Pipa has been studied previously only by J. G. Fischer whose paper, unfortunately, is not to be found in the libraries I have consulted.

VIII(Auditory)VII(Facial) and V(Trigeminal) nerves. These three nerves have a common origin from the side of the medulla oblongata, arising by fibres among which the roots of separate nerves cannot be distinguished.

The auditory nerve separates directly and goes to the large auditory ganglion, situated in a foramen in the wall of the otic capsule immediately opposite the common origin of the three nerves from the medulla.

From this ganglion three groups of nerves arise, which may be taken up in order, beginning with the most posterior. The posterior ramus or group consists of the ramulus posterior (*r.p.*), the ramulus neglectus (*r.a.neg.*), the ramulus basilaris (*r.bas.*), and the ramulus lagenæ (*r.a.lag.*). The ramulus posterior leaves the posterior side of the ganglion, and runs outward and backward to the ampulla of the posterior semicircular canal, over the sensory epithelium of which it is distributed. The ramulus neglectus leaves the ganglion in company with the preceding nerve and soon distributes itself to the pars neglecta of the sacculus. The ramulus basilaris has a similar course to the pars basilaris of the cochlea. The fourth and last of this group, the ramulus lagenæ, has a more ventral origin and runs somewhat ventrally to the lagena. The second branch of the Auditory nerve, the ramulus sacculi, consists of a large branch running outward and spreading slightly, forming a large brush distributed over the macula acustica on the lower side of the sacculus. The third group consists of the nerves to the two anterior ampullæ. They arise as a single nerve from the anterior side of the ganglion and run forward and outward. Then they divide to go to their respective ampullæ. The ramulus anterior (*r.a.a.*) makes a turn around the external semicircular canal to reach its own ampullæ.

After the separation of the auditory nerve, the V and

VII continue forward along the side of the brain, until they enlarge into a ganglion,— the Gasserian — oval as viewed from above, situated proximally within and distally without the cranial walls. The facial nerve arises as two branches, one lateral, the other ventral, near the middle of this ganglion. The former of these (*coms.g.*) forms the commissure between the facial nerve and the glossopharyngeal. Its course is at first outward, then it curves backward in an horizontal plane until it joins the glossopharyngeal nerve directly opposite the origin of the V, VII and VIII from the brain. Its further course is that of the glossopharyngeal. The large loop which it forms is necessitated by the fact that it has to pass around the otic capsule, close to the walls of which it runs.

The other branch, the facial proper (*fac.*) takes an outward and downward course from its origin from the ventral side of the ganglion. It soon divides into a large ramus to the lower jaw (*hy.man.*) and a palatine ramus (*p.*), to the roof of the mouth. Immediately on separation the palatine runs forward and inward and then directly forward above the roof of the mouth, until near the anterior wall of the orbit it gives rise to an anastomosing commissure connecting it with the ramus nasalis of the trigeminal. Beyond this commissure the palatine bends inward and distributes itself to the epithelium of the mouth and the internal choana. I do not find a branch of the palatine continuing forward through the vomer to the region of the snout as in other Batrachia. The fact that the nerve does not extend forward to the nose precludes the possibility of there being any connection between it and the frontalis or nasalis other than the commissure above mentioned. A terminal connection between the palatine and the trigeminal is described by Ecker in *Rana esculenta*. He also mentions a double origin for the palatine from the separate

ganglions of V and VII. My study of *Pipa* gives no indication of such a dual condition, since the nerve arises not from the common ganglion of the V and VII, but as a branch of the facial nerve.

After the separation of the palatine, the main branch of the facial (*hy.man.*)¹, turns outward and backward for some distance, passing along a groove in the ventral side of the otic capsule, between it and the roof of the mouth. Thence it passes downward around the buccal cleft to the lower jaw. After making this turn, the hyomandibularis runs forward on the inner side of Meckel's cartilage along the floor of the mouth. It soon gives off a branch (*buc.*), which in turn divides to innervate the mucous lining of the mouth. This branch, although scarcely larger than several that are given off later as terminal branches with similar distribution, corresponds most nearly to the buccalis of other forms. The main nerve continues its course forward following the general contour of the jaw and is distributed to the inner lining of the mouth. The chief points of interest in connection with the facial in *Pipa* are the relations of the palatine and the apparent lack of connection between the facial-glossopharyngeal commissure and the facial proper. This of course is to be explained by the peculiar relations of the VII to the V, the facial first appearing as a distinct nerve coming from the trigeminal ganglion, the connection existing in the ganglion itself.

The trigeminal nerve consists of three divisions arising by as many separate roots from the anterior end of the Gasserian ganglion. These three divisions will be described in order corresponding to their origin from the ganglion, namely, the mandibularis, the frontalis, and the supramaxillaris superior.

¹Hyo-mandibularis, Von Plessin = Jugularis, Fischer = Facial, Wyman.

The mandibularis (*man.*)¹ arises from the dorsal side of the anterior end of the Gasserian ganglion and runs outward, upward and forward. Then it turns in a gradual curve backward and in a sharp curve downward through the masseter and temporal muscles until it reaches the angle of the lower jaw, along the outer side of which it runs forward. Just outside of the Gasserian ganglion the mandibularis gives rise to a branch (*mas.*) which innervates the masseter and temporal muscles. Soon after entering the lower jaw it divides into the mandibularis proper and the mentalis which have their usual distribution. The mentalis has at first a more outward course, but later passes inward under the mandibularis to be distributed to the outer skin of the lower jaw. The mandibularis follows along the outer side of the mandible until it almost reaches the symphysis menti, to the integument of which region it is distributed. The only feature especially worthy of notice is that this nerve arises directly from the ganglion, not as a branch of the maxillaris superior.

The frontalis² (*f.*) arises beside the mandibularis, in juxtaposition with which it runs at first and preserves a slightly dorsal and lateral direction forward, passing over the masseter and temporal muscles to reach the orbit. Here it is deflected downward and inward around the eyeball. Then it ascends again upon the anterior side of the orbit and branches outward to innervate the skin of the cheek and the side of the upper jaw. This distribution differs from that in the common frog, where the frontalis sends branches to the lining of the nasal capsule, thus making terminal connection with fibres of the olfactory,

¹Mandibularis, Von Plessin and Rabinowicz=Maxillaris inferior, Fischer=Lower jaw branch, Wyman.

²Frontalis, Von Plessin and Rabinowicz=Nasalis, Fischer=Ophthalmic, Wyman.

and also where the frontalis pierces the premaxillary bone and exchanges fibres with the palatine nerve. This region of the snout is entirely supplied by the maxillaris and nasalis in this form. I failed to discover any branch to the muscles of the eye.

The supramaxillaris superior¹ is the largest ramus of the trigeminal. Almost immediately after leaving the Gasserian ganglion, from the anterior end of which it takes its origin, it becomes divided into two branches: 1. The maxillaris proper. 2. The nasalis of Von Plessin and Rabinowicz.

These two branches have a similar course forward, turning slightly inward and downward. The maxillaris takes a more ventral course than the nasalis, although they do not become widely separated until after the anastomosis between the maxillaris and the palatine has occurred. The maxillaris and the palatine run very nearly parallel throughout their courses and at no very great distance from one another; hence the commissure between them is short compared with its length in most Batrachia. It also presents another and more marked difference from the conditions obtaining in most Batrachia, in that its course is vertical rather than horizontal. After this anastomosis has occurred, the maxillaris continues forward in two branches which distribute themselves in the region of the nose and the side of the jaw. No terminal filaments connecting this nerve with the frontalis or the palatine can be traced.

The nasalis² (*n.*) lies slightly above the maxillaris after their separation, and so preserves an almost horizontal course forward to the tip of the nose, in which region

¹ Supramaxillaris superior, Von Plessin and Rabinowicz = Supramaxillaris, Ecker = Upper maxillary branch, Wyman = Maxillaris superior, Fischer.

² Nasalis, Von Plessin and Rabinowicz.

one of its branches (*a*) is distributed. Branch (*b*) of the nasalis branches outwardly and distributes itself to the integument of the side of the upper jaw. Shortly after the nasalis has divided from the maxillaris, a large branch (*c*) splits off with the following course and distribution: The nerve turns sharply inward and passes over the olfactory nerve to which it gives off a small branch. Thence its course is downward and forward near the roof of the mouth to the snout, passing downward through the pre-maxillary bone for distribution to the region of the upper lip.

There arises from the supramaxillaris, superior soon after leaving the Gasserian ganglion, a nerve which follows along near its parent until it reaches the orbit in which it bends upward and outward. Then it leaves the orbit and turns upward, backward and inward, distributing itself to the cutaneous layer on the top of the head midway between the eyes. This nerve is apparently the same as that which Fischer has described in the case of *Necturus*, as innervating the skin of the dorsal surface of the head. According to Huxley (*Encyl. Brit.*, Art. *Amphibia*), it occurs only in the tadpole of *Anura* and disappears from the adult.

From the maxillaris superior, there also arises a nerve which innervates the superior oblique eye muscle and hence is to be regarded as trochlearis which has remained fused with the fifth, a condition possessing much morphological interest.

The oculomotor nerve (*o.c.m.*) arises the ventral side of the medulla oblongata. Its course is outward and forward within the chondrocranium, then it leaves the chondrocranium through the same foramen as the trigeminal and runs forward to be distributed in the usual manner to the rectus muscles of the eye. The only feature worthy of

comment is the absence of a separate foramen for its exit from the cranium.

The optic nerve (*op.*) presents no special features, either in regard to its origin or its course. Its roots form a very intricate chiasma.

The olfactory nerve (*ol.*) arises from the anterior extremity of the olfactory lobe, passes out through the walls of the skull, and distributes itself to the epithelium of the nasal capsule and to the organ of Jacobson in two branches. There is no indication of two roots like those described by Wiedersheim in the *Gymnophiona* and which have later been commented upon by Burckhardt.

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EXPLANATION OF PLATE REFERENCE LETTERS.

a.b.c. = terminal branches of nasalis.

buc. = buccalis.

com.g. = commissure of VII and IX.

com. = commissure between palatinus and maxillaris.

f. = frontalis.

fac. = facialis.

gph. glossopharyngeal.

gas.gang. = ganglion of V and VII.

hy.man. = hyomandibularis.

man. = mandibularis.

men. = mentalis.

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mas. = masseter.

n. = nasalis.

o.c.m. = oculo-motor.

ol. = olfactory.

op. = optic.

r.a.a. = ramulus acusticus anterior.

r.a.l. = " " exterior.

r.a.p. = " " posterior.

r.a.bas. = " " basilaris.

r.a.neg. = " " neglectus.

r.a.sac. = " " sacculi.

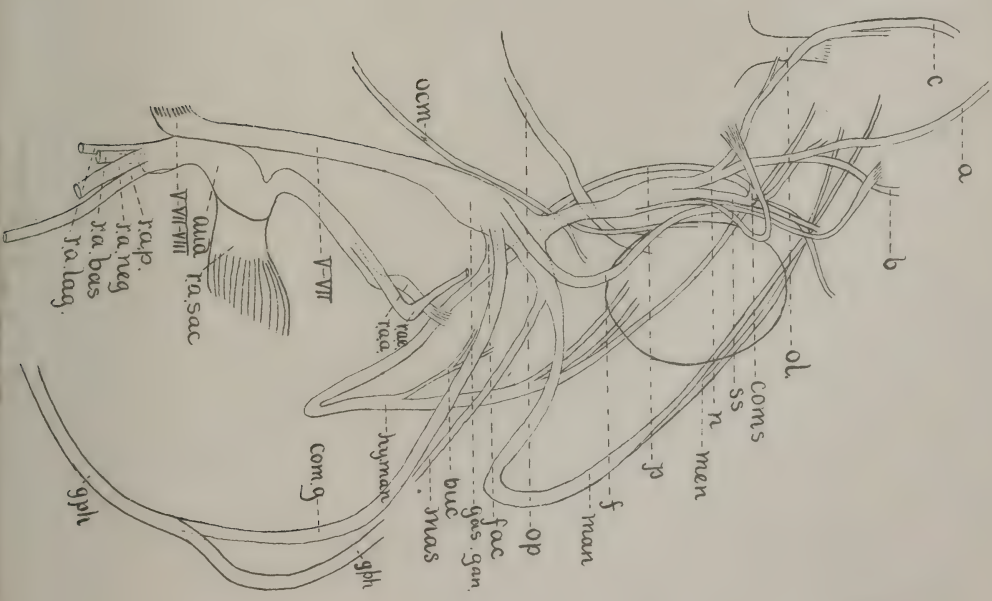
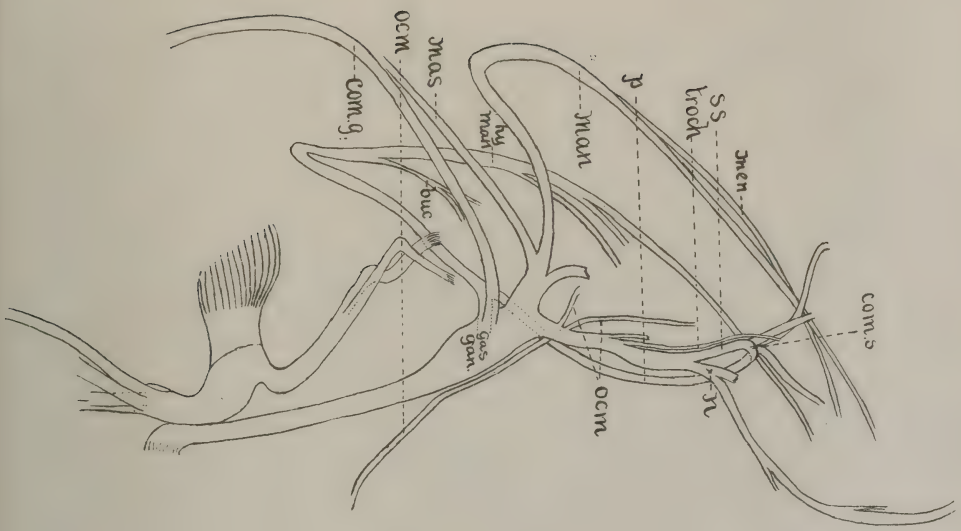
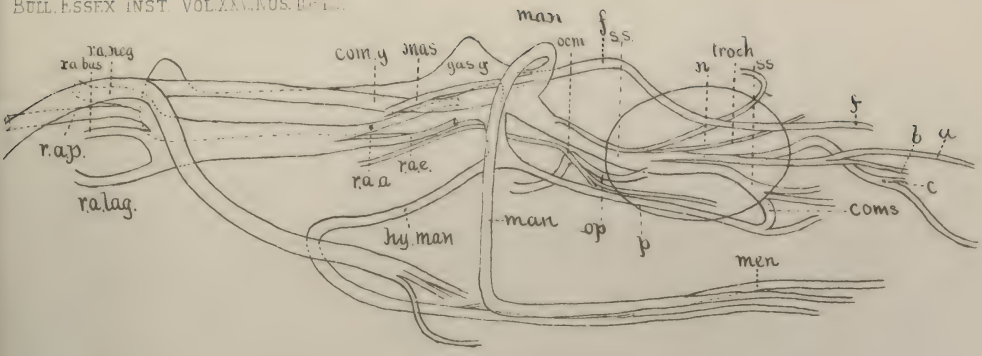
s. s. = supramaxillaris superior.

troct. = trochlearis.

V, VII, VIII = origin of V, VII, and VIII from brain.

FIG. 1. Nervous system of Pipa from the right side.

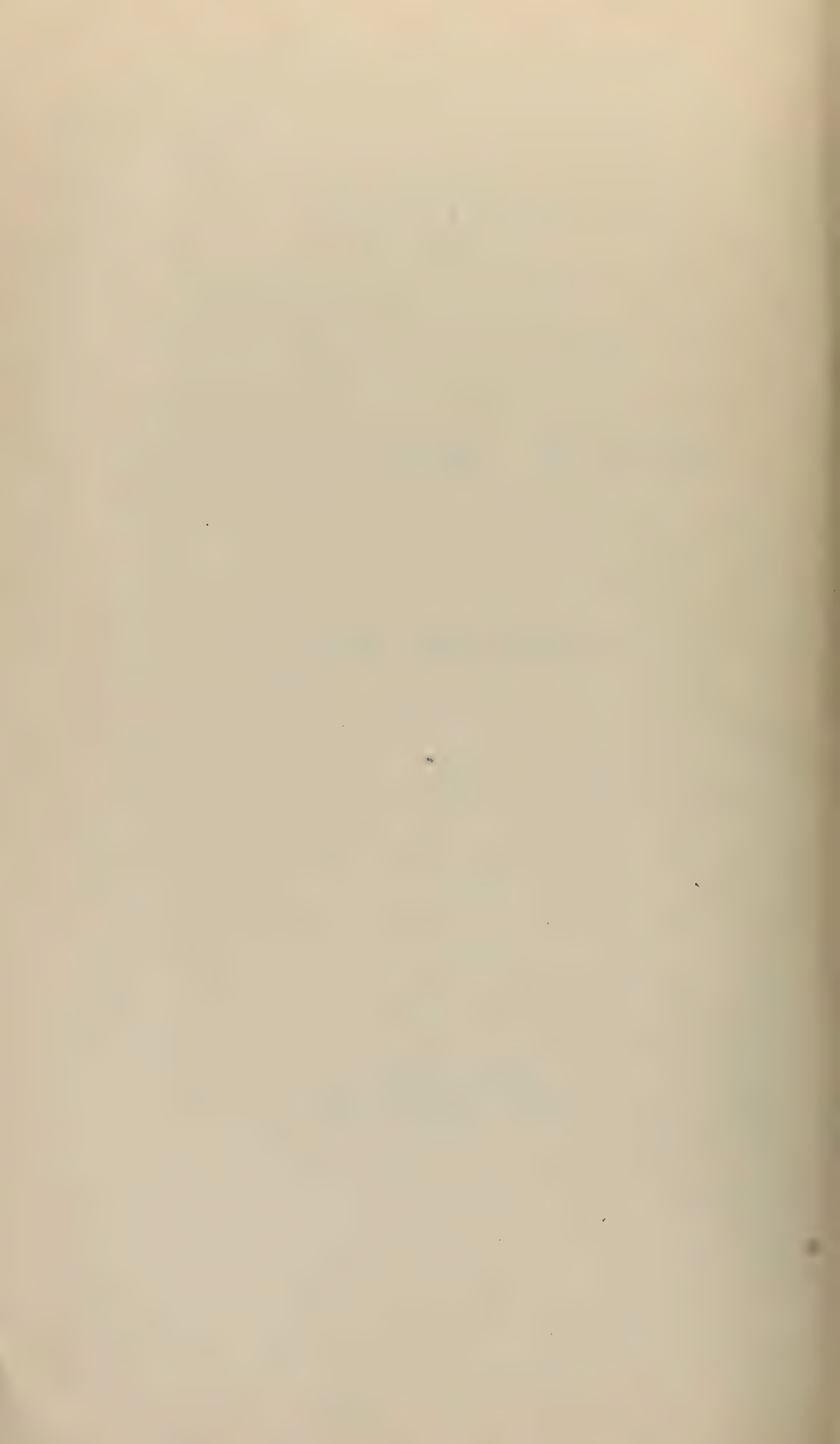
FIG. 2. Same from above. On the left side some of the more dorsal nerves are removed.



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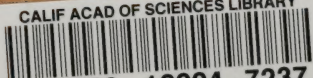
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